AD-A130887
RIA-83-U418
AD A130887
TECHNICAL
LIBRARY

AGARD-CP-337

AGARD-CP-337

AGARD

ADVISORY GROUP FOR AEROSPACE RESEARCH & DEVELOPMENT

7 RUE ANCELLE 92200 NEUILLY SUR SEINE FRANCE

AGARD CONFERENCE PROCEEDINGS No. 337

Use of Scientific and Technical Information in the NATO Countries

NORTH ATLANTIC TREATY ORGANIZATION

DISTRIBUTION AND AVAILABILITY
ON BACK COVER

AGARD-CP-337

NORTH ATLANTIC TREATY ORGANIZATION

ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT

(ORGANISATION DU TRAITE DE L'ATLANTIQUE NORD)

AGARD Conference Proceedings No.337

USE OF SCIENTIFIC AND TECHNICAL INFORMATION IN THE NATO COUNTRIES

Copies of papers presented at the Technical Information Panel Specialists' Meeting held in Rome, Italy on 29–30 September 1982

THE MISSION OF AGARD

The mission of AGARD is to bring together the leading personalities of the NATO nations in the fields of science and technology relating to aerospace for the following purposes:

- Exchanging of scientific and technical information;
- Continuously stimulating advances in the aerospace sciences relevant to strengthening the common defence posture;
- Improving the co-operation among member nations in aerospace research and development;
- Providing scientific and technical advice and assistance to the North Atlantic Military Committee in the field of aerospace research and development;
- Rendering scientific and technical assistance, as requested, to other NATO bodies and to member nations in connection with research and development problems in the aerospace field;
- Providing assistance to member nations for the purpose of increasing their scientific and technical potential;
- Recommending effective ways for the member nations to use their research and development capabilities for the common benefit of the NATO community.

The highest authority within AGARD is the National Delegates Board consisting of officially appointed senior representatives from each member nation. The mission of AGARD is carried out through the Panels which are composed of experts appointed by the National Delegates, the Consultant and Exchange Programme and the Aerospace Applications Studies Programme. The results of AGARD work are reported to the member nations and the NATO Authorities through the AGARD series of publications of which this is one.

Participation in AGARD activities is by invitation only and is normally limited to citizens of the NATO nations.

The content of this publication has been reproduced
directly from material supplied by AGARD or the authors.

Published March 1983

Copyright © AGARD 1983
All Rights Reserved

ISBN 92-835-0325-2

Printed by Specialised Printing Services Limited
40 Chigwell Lane, Loughton, Essex IG10 3TZ

THEME

The main purpose of this Specialists' Meeting was to disseminate more widely information concerning the demand for, and utilization of, scientific and technical information services in the NATO Countries, and particularly those services operating in the fields of aerospace and defense. The increase in such demand is well-known. What are less well-recognized are the specific nature of these requirements and how Government Departments and Agencies, Universities, and Industrial Organizations are coping with them.

The Meeting addressed the structure and operation of defence information centres in the NATO countries; requirements for networking, translation services, and communications access and described current capabilities in the areas of on-line services, data bases, and document delivery systems. Problems encountered in Italy in meeting current requirements were specifically addressed.

THEME

Cette réunion de Spécialistes a eu pour objectif essentiel une plus large dissémination des informations sur la demande en matière de services d'informations scientifiques et techniques dans les pays de l'OTAN et sur l'utilisation de ces services, en particulier ceux qui se consacrent au domaine aérospatiale et à la défense. L'accroissement de cette demand est un fait bien connu. Moins bien connus, cependant, sont la nature spécifique des besoins et la façon dont les agences et services gouvernementaux, les universités et les organisations industrielles y satisfont.

Au cours de la réunion étaient traités la structure et le fonctionnement des centres d'informations sur la défense dans les pays de l'OTAN, et les besoins au plan de l'etablissement de réseaux, des services de traduction et de l'accès aux communications; étaient également décrites les possibilités actuelles touchant les services en direct, les bases de données et les systèmes de distribution de documents. Les problèmes que les besoins actuels posent à l'Italie étaient spécifiquement étudiés.

TECHNICAL INFORMATION PANEL

CHAIRMAN: Mr H.E.Sauter
Administrator
Defense Technical
Information Center
Defense Logistics Agency
Alexandria, VA 22314
USA

DEPUTY CHAIRMAN: Mr H.K.Krog
Managing Director
Norwegian Centre for
Informatics
Forskningsveien 1
Oslo 3
Norway

PROGRAMME COMMITTEE

Mr H.E.Sauter
Administrator
Defense Technical Information Center
Defense Logistics Agency
Alexandria, VA 22314
USA

Mr R.Bernhardt
Leiter de Hauptabteilung Datenverarbeitung
Gesellschaft für Information und
Dokumentation (GID)
Herriotstrasse 5
6000 Frankfurt am Main 71
Federal Republic of Germany

Mr J.G.Coyne, Manager
Technical Information Center
Department of Energy
P.O. Box 62
Oak Ridge, Tennessee 37380
USA

Mr D.W.Goode
Chief Librarian
Royal Aircraft Establishment
Procurement Executive, MOD
Farnborough, Hants GU14 6TD
UK

Ing. Gén. J.A.J.Guilleminet
Directeur Adjoint du CEDOCAR
26 Bld Victor
75996 Paris Armées
France

Mr H.K.Krog
Managing Director
Norwegian Center for Informatics
Forskningsveien 1
Oslo 3
Norway

Mr L.N.Lushina
Director
Information Systems Division
NASA Headquarters (Code NS-11)
Washington DC 20546
USA

Col. G.Morelli
Direttore
Centro di Documentazione Tecnico
Scientifico della Difesa
Via Clitunno 33
00198 Rome
Italy

MEETING COORDINATORS

Lt Col. Dott. F.Vagnarelli
Aeronautica Militare
Ufficio del Delegato Nazionale
all'AGARD
Piazzale K. Adenauer 3
00144 Roma/EUR
Italy

Col. G.Morelli
Direttore
Centro di Documentazione Tecnico
Scientifica della Difesa
Via Clitunno 33
00198 Rome
Italy

PANEL EXECUTIVE

Mr E.T.Sharp
AGARD/NATO
7 rue Ancelle
92200 Neuilly sur Seine
France

The Technical Information Panel wishes to express its thanks to the Italian National Delegates to AGARD for the invitation to hold its 35th Panel Meeting in Rome, and for the personnel and facilities made available for this meeting.

CONTENTS

	Page
THEME	iii
TECHNICAL INFORMATION PANEL AND PROGRAMME OFFICERS	iv
	Reference
SESSION I – ORGANISATIONAL STRUCTURE AND OPERATION OF DEFENCE/AEROSPACE INFORMATION CENTRES	
ORGANIZATIONAL STRUCTURE AND OPERATION OF DEFENCE AND AEROSPACE INFORMATION CENTERS IN THE FEDERAL REPUBLIC OF GERMANY by H.Braun and G.Tittlbach	1
ROYAL NETHERLANDS ARMED FORCES SCIENTIFIC AND TECHNICAL DOCUMENTATION- AND INFORMATION-CENTRE (TDCK) by E.Grützmacher	2
THE ITALIAN DEFENCE SCIENTIFIC AND TECHNICAL DOCUMENTATION CENTER by G.Morelli	3
ORGANIZATIONAL STRUCTURE AND OPERATION OF DEFENSE/AEROSPACE INFORMATION CENTERS IN THE UNITED STATES OF AMERICA by H.E.Sauter and L.N.Lushina	4
SESSION II – TYPICAL SERVICES AVAILABLE FROM DEFENCE/AEROSPACE AND OTHER TECHNICAL INFORMATION CENTRES	
SCIENTIFIC AND TECHNICAL REPORT SERVICES by T.Norton	5
INTERNATIONAL INFORMATION EXCHANGE by J.E. van Dijk, J.M.H.Heijnen, P.J.C.Rosenbrand and H.F. de Vries	6
INFORMATION ANALYSIS CENTRES AND SERVICES by G.J.Zissis	7
ON LINE INFORMATION: THE ITALIAN SITUATION by T.M.Lazzari	8
SESSION III – BENEFITS TO INDUSTRY, GOVERNMENT AND UNIVERSITIES OF A COORDINATED DEFENCE/AEROSPACE INFORMATION STRUCTURE	
BENEFITS TO INDUSTRY (OF COORDINATED DEFENCE/AEROSPACE INFORMATION STRUCTURE) by J.Chander and G.Kirouac	9
AVANTAGES POUR L'ETAT D'UNE COORDINATION DE L'INFORMATION DEFENSE ET AEROSPATIALE ADVANTAGES GAINED BY THE GOVERNMENT FROM A COORDINATION OF DEFENSE-AEROSPACE INFORMATION par C.Paoli	10
BENEFITS TO UNIVERSITIES OF A COORDINATED INFORMATION STRUCTURE by R.A.Gjersvik	11

Reference

COMPARAISON DE RESEAUX D'ACCES AU DOCUMENT:
les schémas décentralisé, semi-centralisé et centralisé
par J.F.Muller 12

INTRODUCTION TO THE FORUM DISCUSSION
by M.P.Carosella D

LIST OF PARTICIPANTS A

ORGANIZATIONAL STRUCTURE AND OPERATION OF DEFENCE AND AEROSPACE INFORMATION CENTERS IN THE FEDERAL REPUBLIC OF GERMANY

by

H. Braun
Dokumentationszentrum der Bundeswehr
Friedrich-Ebert-Allee 34
5300 Bonn 2
Federal Republic of Germany

and

G. Tittlbach
Fachinformationszentrum Energie Physik Mathematik Gmbh
D-7514 Eggenstein-Leopoldshafen 2
Federal Republic of Germany

Historical reasons, different objectives, user groups and national and international interrelations led to seperate development of central I&D activities in the defence and in the aerospace field. In 1954 the Aerospace Documentation Center (ZLD) became operational to fulfill the information demand in research, development and education and other interested public. In 1963 the Federal Armed Forces Documentation Center (DOKZENTBw) was founded as a mainly internal information center within the authority of the Ministry of Defence. Within the framework of the Governmental Information Programme the Aerospace Information Center was integrated into the Fachinformationszentrum Energie Physik Mathematik in 1977.

The objectives, tasks, users and services of both information centers are described in detail. The spectrum of information services covers the production of machine-readable databases, magnetic tape services, the publication of printed information services, online services, individual information services, like retrospective searches and SDIs, and literature supply. Present development, efficiency, operational methods and techniques are discussed as well as the organizational structures, budgets, future trends and matters of cooperation.

1. Historical Review

The avalanche of information, a distinctive mark of our time in all fields of interest, can only be coped with by means of modern documentation and information practices and techniques. In the multidisciplinary aerospace/defence fields in various countries the demand on effective information services was recognized very early, looking especially to the history of reports literature and the corresponding information services, that coincide almost entirely with the development of aeronautics and aircraft industry. As soon as the restrictions to the German aerospace research, development and industry were suspended in the early fifties and the Bundeswehr was set up some years later leading scientific agencies as well as the Federal Minister of Defence and the Federal Minister of Traffic acknowledged the requirement to provide the scientific aerospace community and the German Armed Forces with detailed information on all relevant subjects. But historical reasons, national and international interrelations led to a seperate - but at the same time parallel - development of central I&D activities in these two fields. In 1954 the Zentralstelle für Luftfahrt-Dokumentation (ZLD), the Aerospace Documentation Center was established in Munich as an institute of the Wissenschaftliche Gesellschaft für Luftfahrt and the Deutsche Versuchsanstalt für Luftfahrt. In 1963, assisted among others by a NATO Recommendation (AC/137 - B/40), the Federal Minister of Defence established the Federal Armed Forces Documentation Center (DOKZENTBw) in Bonn.

In the time period from the early beginnings up to date the subjects fields, tasks and information services of both information centers have extended step by step - i.e. the field of astronautics was more and more interesting for scientific and military applications -, the working procedures and techniques have changed, the organizational structures have been modified several times. Due to the different objectives, the different user groups and the different policies of the agencies of authority the two information centers had a partly different development until the present state.

2. Federal Armed Forces Documentation Center (DOKZENTBw)

For nearly 20 years DOKZENTBw has served as the central agency for the Ministry of Defence (MoD) in the field of information. Its location in Bonn, and most certainly its task have remained unchanged throughout the years: to provide adequate information at the right time to all its users. It can be seen as an internal information center with the tasks to make available all the relevant literature information in the wide field of defence and to supply the Ministry itself, all organizations and members of the army and subordinate facilities as well as contractors with its services.

2.1. Organization

Although DOKZENTBw is a military agency, more than 80% of the approximately 100 people working there are civil servants. The Commander, a Colonel, reports directly to the responsible staff division of the MoD, Fü S I 8. Today, DOKZENTBw is organized in four sections. Each of them has its own specific designation. Through concentration of functions and responsibilities wherever possible and partition of tasks wherever necessary best effectiveness has been achieved.

Section A is responsible for the selection and analysis of the literature, i.e. to decide on the relevance of the document, analyze the document and describe its content, and prepare it for the retrieval process. It also does the redactorial work for the active information services. Section B takes care of the technical support services, including the production and storage of master copies of all documents for further duplication, safety film duplicates, and production of the required document copies. It is also responsible for recording the bibliographic and formal data elements of the documents, and the data recording itself. Section C is competent for the information retrieval process. It also runs the extensive printing services and takes care of the voluminous packaging and dispatching work. Section Z, finally, is responsible for the realization of basic documentation tasks, such as the development of new procedures, system analysis, implementation of new techniques, etc. It also conducts the thesaurus work, coordinates all training activities, and supervises a small group of translators. The acquisition of documents, the realization and control of the circulation of periodicals and other literature is the main task of its library.

Considering this allotment and taking into account the well known information process it is evident that close cooperation between these four sections is indispensible.

2.2. Structure of Defence Documentation

Although DOKZENTBw is the central agency for documentation services within the authority of the MoD, it is only the heart of a complex and complicated structure (see FIG 1). Twelve decentralized documentation units at various military organizations are to assist DOKZENTBw by making available documents resulting from work within their own field of specialization. In order to provide adequate information services within their organizations, most of them are connected by terminals to the DOKZENTBw databases. Some of them even keep collateral stores of documents of their own field of interest. Decentralized documentation units exist, for example, at the Bundeswehr Command and Staff College, the Federal Office for Military Technology and Procurement, the Aeromedical Institute of the German Air Force, the Bundeswehr School for Leadership and Civic Education, to name only some of them. In addition, two documentation contractors work on behalf of DOKZENTBw, preparing very specific documents: The Technical Society for Naval Construction and the German Society for Detection and Navigation.

Twenty on-pay contributors, to a large extent retired officers and other former DOKZENTBw personnel, do substantial work on the input side. Several documentation circles within the Bundeswehr are responsible for the preparation of relevant documents within the scope of their responsibility. Eighty documentation liaison officers, most of them at the various training facilities and schools of the Bundeswehr and at the major military offices, keep close contact in order to ensure best services for their institutions.

There is yet to mention the slowly increasing number of offices such as the Bundeswehr universities, the central library of Bundeswehr, MoD staff divisions, which are connected by terminals to DOKZENTBw.

The supervision of all these contributors, the provision of adequate training for the personnel, and the coordination of all the various activities requires considerable efforts and a good organization.

2.3. Fields of Interest, Information Services and Users

The fields of interest relevant to national defence are numerous, so defence documentation has to cover a wide spectrum. It is, for example, concerned with defence policies, strategic questions, tactics, armament and logistics of the troops, military training and education, personnel and leadership problems, psychological questions, motivation, medical problems, not to forget the multiple technical aspects of modern warfare, i.e. aeronautics, naval engineering, military vehicles, weapons techniques, ammunition and explosives, and many more.

To cover these subjects, DOKZENTBw holds a stock of more than 800 periodicals, most of them in German, quite a few in English, some in French and a few in other languages. All sort of compilations and abstracting journals are scanned carefully in order to secure relevant literature. All reports initiated by MoD Bonn are administered and processed by DOKZENTBw.

For all documents, documentary reference units are produced, containing the bibliographic dates, an abstract and key words. Disregarding the language of the original document, this information is recorded in German. These reference units are stored in the DOKZENTBw data bases for retrieval with the IBM System STAIRS. DOKZENTBw provides a diversity of services for its users: It publishes more than 20 different abstract journals, the publication of which varies between 4 to 10 times per year. The number of copies (up to 1.500) depends upon the distribution list, i.e. upon the respective number of users. On the basis of the information contained in these journals, the user can request copies of all documents required. On request, DOKZENTBw conducts information retrieval on specific subjects, furnishing the user with the relevant information. If so desired, SDI services (Selective Dissemination of Information) are initiated, providing the user automatically with newly acquired literature for a certain period of time.

Here, too, DOKZENTBw provides full text copies of each document on request, a labour-intensive service, but a must for quick and comprehensive information. DOKZENTBw is also responsible for securing all sorts of documents, especially reports and studies, from within Germany and abroad for the defence community, if requested.

All these services are being granted to the MoD, Government departments, Headquarters, and all units of the Bundeswehr. Of course, our NATO allies may take advantage of DOKZENTBw information services at any time. All MoD contractors are obliged to contact DOKZENTBw and request all available information concerning their projects. All services mentioned above are free of charge.

A few words concerning the national and international relations between DOKZENTBw and similar institutions. Of course, DOKZENTBw is not able to satisfy all information requests of its users by relying solely on the information stored in its own databases. Therefore, it uses the services of the technical information centers within Germany, such as DIMDI (German Institute for Medical Documentation and Information) and Fachinformationszentrum Energie, Physik, Mathematik, the latter running an agency in Bonn, thus granting access to its own databases and supplementary via Euronet or Telenet/Tymnet, to a broad variety of databases in Europe and North America.

Within the NATO countries, close contacts exist between DOKZENTBw and the other Defence Documentation Centers. The exchange of information, however, is clearly limited due to language problems on one hand, security regulations and other restrictive directions on the other hand. Good relations are also kept with the Defence Documentation Centers of Austria and Switzerland.

2.4. Efficiency

Finally a few figures, all taken from 1981, to give a better impression of the capabilities (and limitations) of DOKZENTBw:

- The input amounted to about 21.000 documents. One third of these documents were analyzed by DOKZENTBw personnel, the other two thirds by contractors, decentralized documentation offices, and on-pay contributors, as mentioned above.
- 136 individual abstracting journals in 23 regular series and, in addition, 10 special issues covering particular subjects were issued.
- 1.750 subject searches had been conducted, in addition more than 400 SDI services were administered.
- As a result of these information services more than 180.000 documents were requested. As the average document consists of 19 pages, more than 3.500.000 pages had to be copied.
- The printing services handled more than 4.500.000 pages.
- Nearly 1.300 demands for the procurement of report literature had to be taken care of.
- 1.250 translations were forwarded automatically by the translation services of the Bundeswehr to DOKZENTBw for further treatment. Almost 900 additional requests for translations were referred by DOKZENTBw to third parties.

The costs to run this organization amounted to about 1,4 Mio DM. Personnel costs for the regular DOKZENTBw personnel, overheads i.e. costs for the rent of the building, heating and electricity, and all costs for the data processing are not included in this sum. To get best results out of this money must be the intention. Nevertheless, information gaps in the field of national defence cannot be tolerated.

3. Fachinformationszentrum Karlsruhe, the Present Aerospace Information Center

Contrary to DOKZENTBw as a mainly internal information center within the authority of the Ministry of Defence the Aerospace Information Center has to adjust its tasks and services to the information demand of the various governmental sponsored and private users as well as the interested public. It therefore has to consider the governmental information policy, that is embedded in the governmental research and technology policy. The Government's Programme for the Promotion of Information and Documentation has the aim to ensure access to all types of information from the various subject fields and missions, so that existing knowledge and information can be mobilized to meet the scientific, economic, technical, political and social problems of our time and thus avoid wasteful duplication and pure investment. One part of the programme was concerned with the creation and maintainance of effective information systems for large related fields of science and technology. Within the framework of this programme the Aerospace Information Center was integrated with all its functions into the Fachinformationszentrum, officially named FIZ Energie Physik Mathematik, but better known as FIZ 4, when this institution was founded as a company of the Federal Government and the Laender in 1977.

3.1. User Groups, Objectives, Responsibility

In its articles, the Fachinformationszentrum has been given the following tasks:
to make available the scientific-technical information on literature, numerical data and facts in the fields of

- . aeronautics, astronautics, space research
- . energy, nuclear research and technology
- . physics and astronomy
- . mathematics and informatics

for all interested user groups. This mission contains

- . to analyze the world-wide published scientific-technical literature and to record, to store and keep ready the corresponding bibliographic and numerical information as a public task, as well as to announce the national research and development results
- . to provide a spectrum of information services using these databases.

All institutions or persons concerned professionally or privately with questions and problems in aeronautics, astronautics, space research as well as the other subject fields are users or potential users of the Fachinformationszentrum, especially

- research and development institutes
- universities, education and training facilities
- private enterprises: industry, agencies, innovation consultants
- parliaments
- ministries and administration
- social initiative groups and individuals.

The majority of the users are scientists and engineers fulfilling tasks in research, development, education, followed by management and production.

3.2. Topics of Operation and Services

The main topics of operation are (see FIG 2):

(1) Production of bibliographic databases and printed services

The FIZ produces or participates in the production of 9 extensive bibliographic databases in the different subject fields with a total yearly input of about 380.000 items, about 180.000 of them are self-produced or produced on behalf of FIZ. All types of puplications are analyzed, according to international rules for cataloguing, abstracting, classifying and indexing. As you see, there exists the aim of extensive international, bi- or multilateral cooperation. The main partners are the European Space Agency and the NASA in the aerospace field, the US Department of Energy, the International Atomic Energy Agency and the INIS member states, the International Energy Agency, the American Institute of Physics in the other subject fields. The cooperation effects the completeness of the input and cost reduction.

The most interesting aerospace database is the NASA database, consisting of the Scientific and Technical Aerospace Reports and the International Aerospace Abstracts. Due to the information policy of NASA and the contract between NASA and ESA, the ESA - Information Retrieval Service is responsible for the European input concerning reports literature. Within the Tripartite Arrangement the Fachinformationszentrum is approved by NASA and ESA as National Center, repsonsible for the German input coordination. The FIZ collects the German reports and sends them to ESA. No bilateral arrangement between NASA and FIZ like the cooperation arrangement with the US Department of Energy was possible up to date.

The leading self produced databases of the FIZ are Physics Briefs/Physikalische Berichte and Zentralblatt für Mathematik/Mathematical Abstracts, information services are printed abstract journals and magnetic tape services.

(2) Production of numerical and factual databases and data compilations

The Fachinformationszentrum participates in a lot of international or bilateral activities of the production and updating of numerical or factual databases, like the Evaluated Nuclear Structure Data File, the Energy and Economic Databank, the C13 NMR Database, and data compilations, especially in the field of energy and physics. In 1981 FIZ was engaged with 9 databases and 16 data compilations. These activities of information analysis are a further step from reference information to knowledge information. All services are performed in cooperation with information analysis and data centers as well as research and development establishments, universities and industrial firms with experience in data evaluation and compilation.

(3) Host and computer service

The INKA Host of the Fachinformationszentrum offers the online access to its self and cooperatively produced databases (in concordance with the arranged regulations for the use) and some supplementary commercially available databases in the field of natural sciences, mathematics and engineering. In 1981 14 bibliographic databanks with a total content of 6,1 Mio items were implemented, the online access to 6 numerical databases is planned for the end of 1982. Furtheron the databases of other German database producers and information centers are implemented and offered at cost recovery.

Besides the direct access to the databases the INKA service includes the processing of SDI profiles with online query formulation, the online ordering of documents (in preparation), the consulting, training and supervision of users etc. Access to INKA is achieved via Euronet, national package switching data networks and the public telephone network.

Looking to the aerospace field, online access to the NASA database is only possible via ESA-IRS. Henceforth the Fachinformationszentrum acts as National Center for all the IRS services in Germany.

Furthermore nearly all internal input or output services of the Fachinformationszentrum are computer-supported. The data processing equipment consists of two central processing units of the type Siemens 7.760 and 7.541 with a capacity of $4 \cdot 10^6$ Byte and $3 \cdot 10^6$ Byte respectively and comprehensive peripherical equipment with a total storage cpacity of about $25 \cdot 10^9$ Byte. As far as possible from outside available software packages are used, a small own staff of programmers is engaged with the adaption and the extension of the computer programs.

(4) Individual information services

The Fachinformationszentrum offers and prepares individual information services on literature, numerical data and facts, i.e. retrospective searches, SDI profiles, bibliographies on topical subjects, scientific and technical information to all kinds of inquiries, as well as special services of information analysis and consultancy on request. Mainly the databases of the own host are used, in special cases supplemented by using other databank suppliers, for example ESA-IRS with its NASA database. To satisfy the individual user needs close contact and cooperation exists with external regional or branch-oriented information offices and innovation consultants.

(5) Literature supply

In collaboration with the Technische Informationsbibliothek Hannover, the central German library for natural sciences and engineering, FIZ provides the users with original documents, especially with technical reports, conference papers, dissertations and other "non-conventional" literature. Nearly all reports in aeronautics, astronautics, space research and the other fields of subject are available at the Fachinformationszentrum.

(6) Infrastructural tasks of information science and techniques

The effective operation of the information center and the progress in information handling and techniques require a future oriented information management, qualified personnel, modern information techniques and efficient procedures. Planning and controling services, developing new information services, marketing the information services, improving the procedures, adapting and testing new information techniques, education and training are therefore current tasks. Some current projects are concerned with the extension of the numerical data documentation, electronical components of handbooks, the application of DOR (Digital Optical Recording) in the information field, the improvement of the online access to the information via different communication channels and so on.

3.3. Organizational Structure and Budget

After the comprehensive survey of the operation and the information services of the Fachinformationszentrum finally a few words to questions of the organizational structure and the budget. All the activities are performed by qualified personnel and supported by modern information techniques. The staff consists of about 250 persons, about 70 of them are scientists or engineers. Furthermore external subject specialists, indexers or other on-pay contributors and a lot of partners for scientific or technical cooperation are engaged. The total budget for all activities of the Fachinformationszentrum is about 28 Mio DM, more than 40% are personnel costs.

The organizational structure of the Fachinformationszentrum is as follows (see FIG 3): There are a Scientific-Technical Directorate and an Administrative Directorate, with one director each. The Offices for Information Management and Communication assist the Scientific-Technical Director. The Scientific-Technical Directorate is subdivided into 4 divisions:

. 3 Scientific Divisions with experts of the different subject fields, responsible for all scientific activities. Two divisions are concerned with bibliographical information, one division with numerical and factual data. Input and output activities are in one hand.
. The Division of Information Techniques, responsible for the host and the online service and for the technical assistance of all scientific services.

According to the articles of association the information center is supervised by a Supervisory Board (Aufsichtsrat) and a Corporate Member Board (Gesellschafterversammlung) and advised by a User Advisory Board and Adhoc Advisory Committees.

4. Conclusions and outlook

The parallel establishment of the Federal Armed Forces Documentation Center, mainly satisfying the internal information demand within the authority of the Ministry of Defence, and the Aerospace Information Center for the scientific and technical public has been proved true as well as the integration of the Aerospace Information Center into a larger well equipped information center. The activities are embedded in the official governmental information policy, modifications and new developments in the national and international interrelations are transferred to the actual management and the services of the centers. New developments in information techniques and communications are proved and adapted, new methods of information handling and management are introduced step by step.

Looking to the international relations and analogue interests there are good contacts to the Defence Information Centers of the NATO countries and to ESA and NASA. The decision that the Fachinformationszentrum acts as the full National Center of the ESA-IRS in Germany opens a new period of close cooperation. But it is recommended to extend the cooperation by bi- or multilateral arrangements between the Defence Information Centers at the one hand and between NASA and the Fachinformationszentrum on the other hand for further purposes, especially in the field of non-bibliographic information.

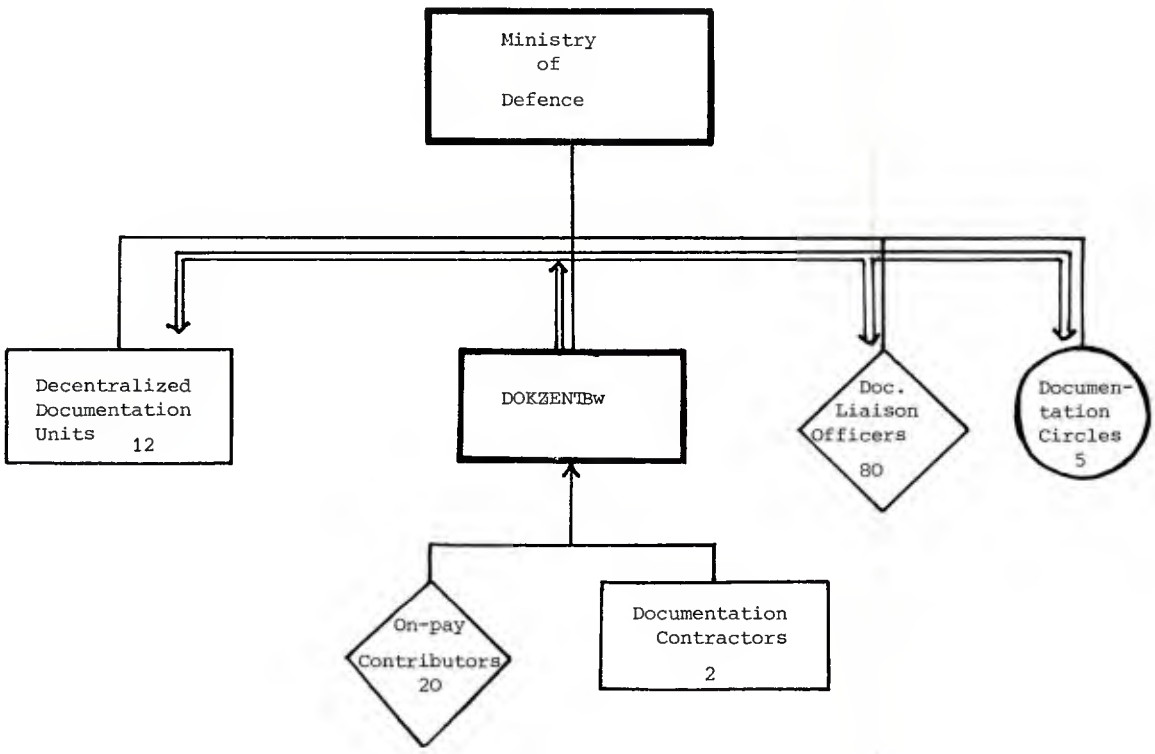


FIG 1: STRUCTURE OF THE DEFENCE DOCUMENTATION

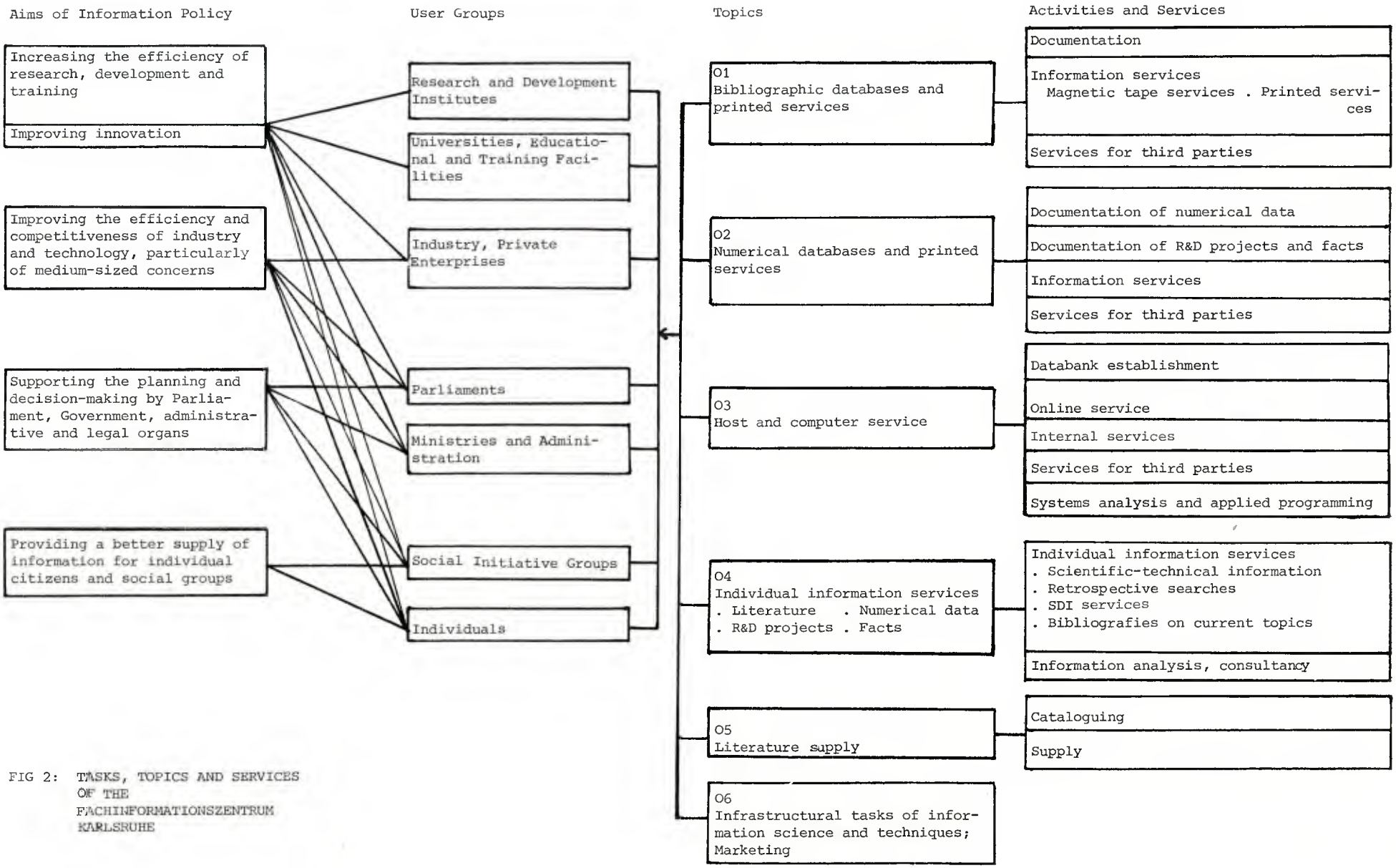


FIG 2: TASKS, TOPICS AND SERVICES OF THE FACHINFORMATIONSZENTRUM KARLSRUHE

. 3 Scientific Divisions with experts of the different subject fields, responsible for all scientific activities. Two divisions are concerned with bibliographical information, one division with numerical and factual data. Input and output activities are in one hand.
. The Division of Information Techniques, responsible for the host and the online service and for the technical assistance of all scientific services.

According to the articles of association the information center is supervised by a Supervisory Board (Aufsichtsrat) and a Corporate Member Board (Gesellschafterversammlung) and advised by a User Advisory Board and Adhoc Advisory Committees.

4. Conclusions and outlook

The parallel establishment of the Federal Armed Forces Documentation Center, mainly satisfying the internal information demand within the authority of the Ministry of Defence, and the Aerospace Information Center for the scientific and technical public has been proved true as well as the integration of the Aerospace Information Center into a larger well equipped information center. The activities are embedded in the official governmental information policy, modifications and new developments in the national and international interrelations are transferred to the actual management and the services of the centers. New developments in information techniques and communications are proved and adapted, new methods of information handling and management are introduced step by step.

Looking to the international relations and analogue interests there are good contacts to the Defence Information Centers of the NATO countries and to ESA and NASA. The decision that the Fachinformationszentrum acts as the full National Center of the ESA-IRS in Germany opens a new period of close cooperation. But it is recommended to extend the cooperation by bi- or multilateral arrangements between the Defence Information Centers at the one hand and between NASA and the Fachinformationszentrum on the other hand for further purposes, especially in the field of non-bibliographic information.

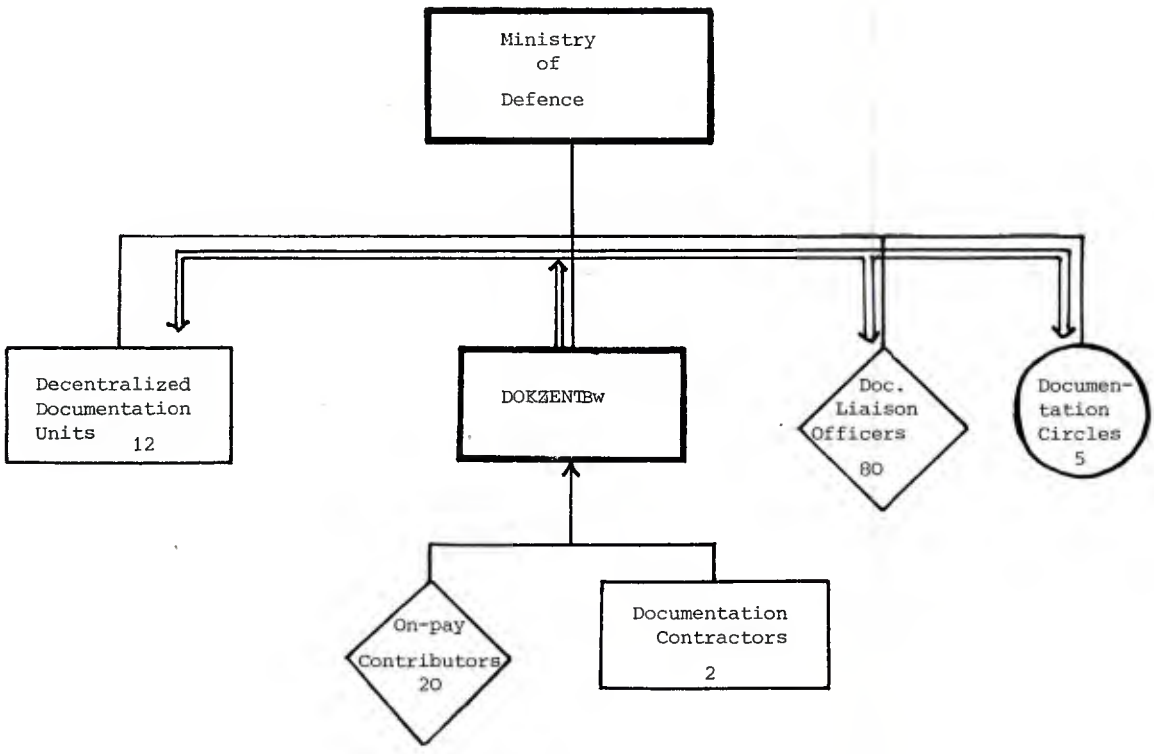


FIG 1: STRUCTURE OF THE DEFENCE DOCUMENTATION

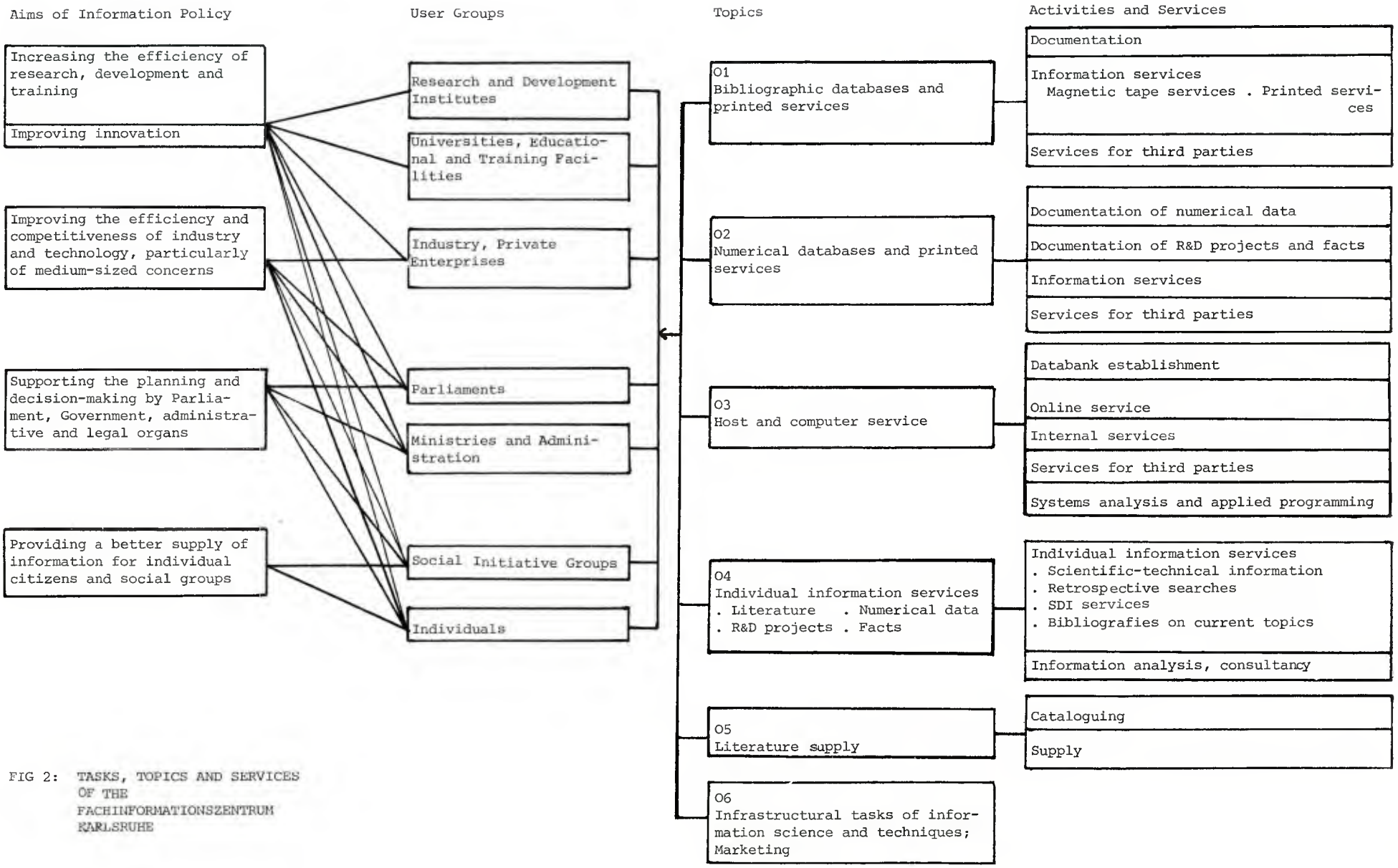


FIG 2: TASKS, TOPICS AND SERVICES OF THE FACHINFORMATIONSZENTRUM KARLSRUHE

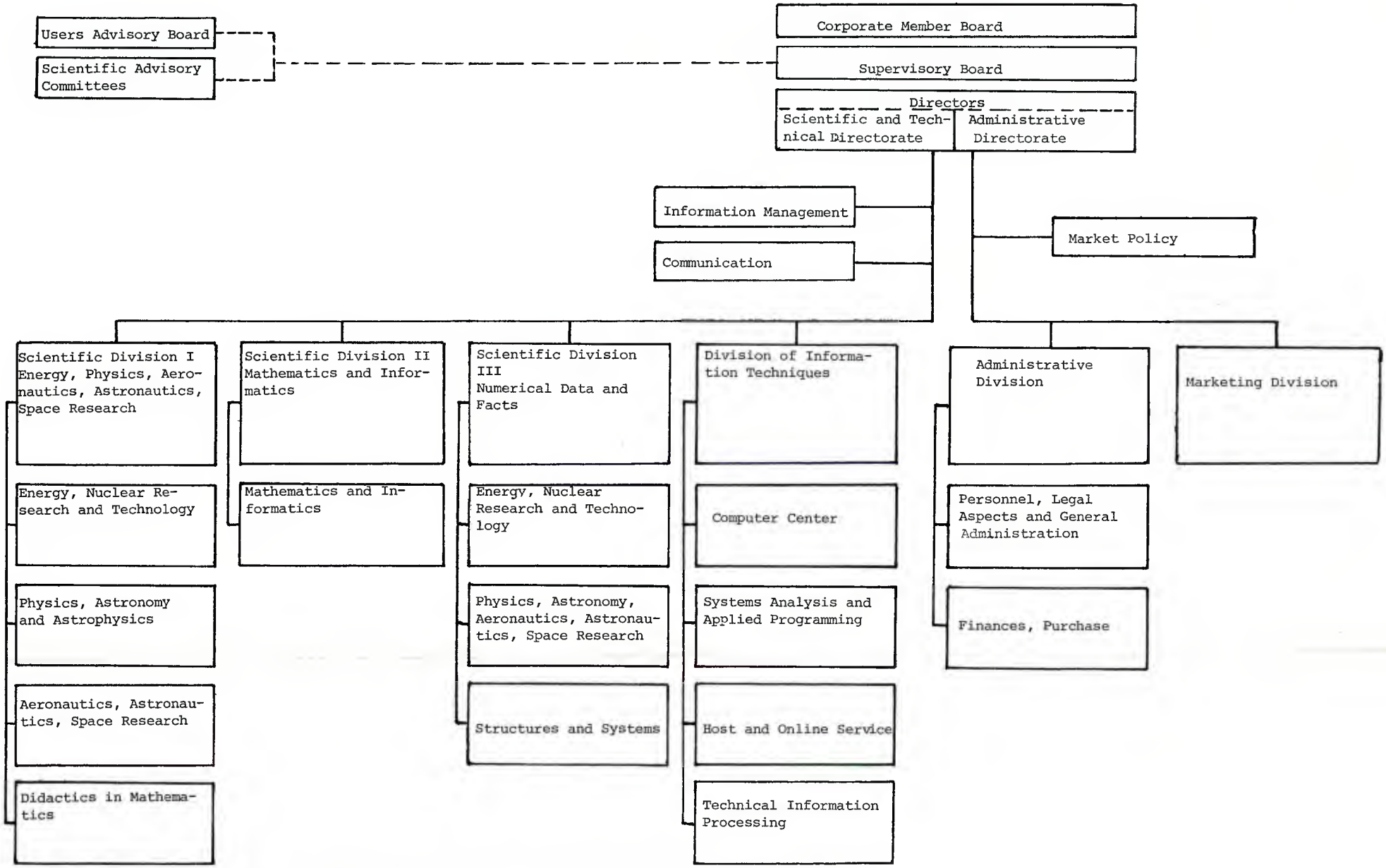


FIG 3 : ORGANIZATIONAL STRUCTURE OF THE FACHINFORMATIONSZENTRUM, KARLSRUHE.

ROYAL NETHERLANDS ARMED FORCES SCIENTIFIC AND TECHNICAL DOCUMENTATION- AND INFORMATION-CENTER (TDCK)

by

ir. E. Grützmacher

Director
Postbox 90701
2509 LS THE HAGUE
The Netherlands

SUMMARY

The Netherlands Armed Forces Scientific and Technical Documentation- and Information-Center (TDCK) was instituted in 1954.
It falls under the Directorate-General of Material of the Ministry of Defence.
Its complement consists of 52 personnel-members; after partial automation this number has been reduced to 49.
The objective of TDCK is:

> "To collect, record and make accessible in an efficient way those publications, in the fields of science and/or technology to Defence-organizations, which are relevant to Defence-interests".

The literature-complement comprises magazine articles and reports from Dutch and foreign sources. The users are the members of the Defence-organization (Ministry and the three Armed Forces-units, i.e.: Navy, Army and Air Force) and the Maingroup for Defence Research in the Applied Physics-Research Organization (TNO).
The realization-process has been organized with manually-operated systems.
In the automation-process, which is being dealt with in particular, the first phase ("storage and retrieval") has been completed. The secondary information is being fed into the "STAIRS-data-base" of the Defence Computer Center since the first quarter of 1981.
A constant exchange of documentary information, if necessary on a reciprocity-basis, or against payment, takes place in a national and international context.
About the operating-costs an indication can be given; from the profits no estimate is available.

HISTORICAL REVIEW

In the beginning of the fifties a department of the Bureau for Scientific Research, belonging to the Royal Netherlands Navy (KM), was occupied with technical documentation. This department dealt with the following tasks, i.e.:

- The recording and the maintenance of a general technical documentation on behalf of the technical bureaus and establishments of the Navy (KM)

- The supply of technical advice, obtained from literature-studies.

For this purpose a multitude of technical subjects was documented and a large amount of technical issues was compiled. These compiled technical data also appeared to be of great value for similar bureaus of the Royal Netherlands Army (KL) and the Royal Netherlands Air Force (KLu). It would have been inefficient not to use these data for a larger user-circle, in particular the combined Armed Forces (KM, KL and Klu).
After a thorough preparation, on 8 December 1954 the Royal Netherlands Armed Forces Technical Documentation Center (TDCK) was officially installed by order of the Minister of the War- and Navy-Department.
An important consideration was the urgent need in the whole defence-organization to start a documentary information-supply system.
By keeping to a central and selfcontained representative complement, against acceptable costs, an uncurbed growth within the Armed Forces-departments was avoided.
By ministerial order of 6 June 1958 the denomination was extended to Royal Netherlands Armed Forces Technical Documentation- and Information-Center, and again on 27 November 1960, the present name was finally given, by maintaining the original abbreviation: TDCK. Originally TDCK had 60 personnel-members; around 1975 the complement was diminished to 52 and now the formation has a strength of 49 persons.

ORGANIZATION, TASKS AND AUTHORIZATIONS

TDCK is a particular organization-unit of the Directorate-General of Material of the Ministry of Defence. It falls directly under the Director of Material-Management of the aforementioned Directorate-General (see: Appendix 1)
The Director of Material-Management is assisted by an Advisory Group for TDCK (RvA-

TDCK), as regards the documentary information-supply.
This council consists of 8 members and 1 advisory-member.
Members are: the Coördinator of Defence-research (He also is president of the Advisory Council) and: representatives for the Chief of Defence-Staff, the Directors-General of Personnel, Material, Economics and Finance, including the Heads of the Armed Forces-departments of Scientific Research - (HWO-KM, KL and KLu). The Director of TDCK is the advisory-member.
The Advisory-Council has the following tasks, i.e.:

- To function as a consultative organization, as regards the preparation, execution and procedure of the policy, in so far as the collection, recording and accessibility of publications in scientifically and/or technically relevant areas for Defence is concerned.

- To advise the Director of Material-Management about the policy to be decreed for TDCK.

- To analyze the Annual-reports and to bring out the appropriate advice.
  For a good execution the Advisory-Council also gives the functional advices to the TDCK-Director.

Recently the presently existing organizational and functional description for TDCK has been decreed by Ministerial Order of 6 May 1981.
In this decree has been composed as the aim for TDCK the following, i.e.:

- The collection, description and accessibility of publications on scientific and/or technical subjects relevant to Defence-interests, on behalf of the Defence-organization.

From this objective the following tasks originate:

- The acquisition of scientific and technical publications, significant for Defence-purposes.

- The participation in documentation- and information-pools, important for Defence-purposes.

- The coordination of, and intermediation in, the use of other national information-services.

- The loan of scientific and technical magazines, etc. for a limited duration, from libraries of the Armed Forces, having subscriptions to this information.
  TDCK has the right to receive this information on first-hand loan.

- The supply of secondary information of selected reports and magazine-articles, among which the compilation of analyzing and indicative abstracts.

- The compilation and supply of literature-surveys, bibliographies, and such.

- The upkeep of a reports-center, as regards the scientific and technical Defence-reports.

- The compilation of a central-military catalogue; the manufacture and consequent supply of a central list of acquisitions of new books and magazines, obtained by Defence-libraries.

- The supply on demand of:

    - reprints of magazine-articles, published in the literature-surveys
    - reports by the reports-center on a loan-basis

In addition to his function the Director of TDCK also is:

- a member of the Coordination-Committee for Library- and Documentation-affairs. This Coordination-Committee is part of the Permanent Committee for Documentary-Information-Supply.
  In these Committees all Ministeries are represented.

- President of the Advisory-Committee for the Armed-Forces libraries.
  The purpose of this last committee is to keep up the contact between the libraries, as regards the library-technical affairs, as well as the giving of advice, regarding such library-technical details as institutioning, personnel-affairs, collectioning, etc.

- a member of the "Technical Information Panel of AGARD".

The established organization-structure has been indicated in Appendix II.

After having been partly computerized, the personnel-staff of TDCK now consists of 49 members, of which 36 are civilian employees, and 13 are military men, who are academically-trained reserve-officers.

There are 2 administrative bureaus, i.e.:

- Bureau for General-Affairs,
- Bureau for Library-Affairs, as well as:

4 documentation- and information-bureaus, i.e.:

- Bureau for Engineering-Sciences
- Bureau for Military-Sciences
- Bureau for Military Management-Sciences, and
- Bureau for Military Medical-Sciences.

Next to these, there is added a Section for Civil Defence. This section comes under the Ministry of Home Affairs. For efficiency-purposes, the documentalist-informer for Civil Defence-Affairs has been placed in the TDCK-formation.

Each bureau has been sub-divided into sections.

The Bureau for General-Affairs consists of 11 personnel-members.
The Section Administration of this bureau is occupied with:

- the acquisition of the reports, magazines, etc.
- the normal secretarial jobs
- the typing-work

For the typing-work, use is presently made of modern word-processing equipment and terminal-display apparatus, for the input of the documentary information-data into the computer of the Defence Computer Center.
The section Security and Information looks after:

- the mail-dispatch
- the documentary information for the library-documentation and -security. Therefore a literature-survey is published three times a year.
- the information, which cannot be supplied by the documentation- and information-bureaus outside TDCK.
- the management of the UDC-Card index.
- the management of the "STAIRS-data base", which is in a progressive stage.
- the security-function, as regards the mail-handling, internal and external contacts, the safe-guarding of the document-assets, etc. etc.

For this area, the security-official is functionally responsible to the security-officer of the Ministry, who also provides advice, directives and such.

The Bureau Library consists of:

- the section : Reports-Central Office
- the section : Magazine-Central Office
- the section : Central Military-Catalogue
- the section : Reproduction

This bureau has also been given the management of the Thesaurus-card index, and has a staff of 16.

The section Reports-Central Office has been given the following tasks:

- the administrative- and material-management of the TDCK-reports. This management comprises the reports in hardcopy-microfiche or in microfilm-form.
- the catalogues, a source-index and 4 numerical indexes (TDCK-, NTIS, NASA-, and HDO/TNO-indexes), to be kept up-to-date for retrieval-purposes.
  These indexes are still included in a manually-operated fiche- or cardindex-asset.
- the requirement-determination of the reports to be acquired, after a selection by the documentalists-informer.
- the periodically publishing of an accession-list of newly arrived scientific and technical reports.

The workload of the section Magazine-Central Office consists of:

- the reception and return of the magazines, obtained from the Armed Forces libraries for scannning, as well as those magazines provided by own subscriptions.
- the circulation of the magazines within TDCK.
- dealing with the photocopies, on behalf of the documentalists-informer and the applicants for literature (mainly members of the Armed Forces).
- the management of the master-copies of the documented magazine-articles.

The Central Military-Catalogue is occupied with the registration of all books and magazines, which have been acquired by the Armed Forces. A dual set of catalogues is kept for this purpose and this comprises an alphabetical index to the main entry (in general the author's name) and one for the first word of the title (grammatical articles excepted).

Naturally, these are still manually-operated card-or fiche-systems.
Applications for literature are being directed to the appropriate libraries.
A monthly accession-list of newly acquired books is published and issued.
A yearly list of magazine-subscriptions is published.

The documentation- and information-bureaus, sub-divided into sections, almost cover the complete field of interest of the Defence-authorities. The partition in engineering-, military- and management-sciences, as well as in military medical-science, is a reflection thereof. The following disciplines can be distinguished, i.e.:

- general mechanical-engineering and workshop-practice
- transport-technique and internal-transport
- shipbuilding and shipping-technique
- aircraft-engineering and space-technology
- operational research
- electrical engineering (electronics and computer-technology included)
- physics and reactor technology
- chemical technology
- oceanography and navigation
- meteorology and climatology
- tactics and strategy (politicology included)
- armament-technique
- military engineering
- management technique (including economics, personnel and logistics)
- military medical-science (psychology included)
- civil-defence. The documentalist-informer for this subject belongs to the Ministry of Home Affairs and is detached to TDCK permanently, for his daily work.

The complement of the above mentioned bureaus, exclusive "civil-defence", consists of 9 civil-servants and 13 reserve-officers, academically-trained, who have finished their universitary-study recently, and who perform their military duties as conscripts.
They are all occupied with the documentation- and information-task and this comprises, a.o.:

- to trace, select and collect the scientific and policy-relevant literature and/or literature-data, published inland or in foreign countries, in each of their disciplines.
- to disclose the above-mentioned literature and to compile literature-surveys
- to answer questions and give information by means of providing literature
- to study and pursue relevant developments in the concerned discipline

To be able to perform these tasks in a proper way, the documentalist-informer has:

- to have know-how of research-activities and management-developments within the Ministry of Defence and the Armed Forces, as far as his professional vocation is concerned.
- to select the received literature, involving the interest-pattern of the users; to excerpt the selected literature in the form of an abstract, preferably in the language of the original publication, and to classify the contents with the aid of the Universal Decimal Classification-system and the TDCK-Thesaurus.
- to compose a monthly literature-survey from the produced abstracts; if necessary, dependent on demand and interests, a bibliography of a specified subject or a year-index (title-index of the published abstracts).
- to make use of the present retrieval-assets (UDC- and Thesaurus-card-indexes and the STAIRS-data-base), in answer to requests for a literature-search,
- to review the available literature-sources, with references to literature available elsewhere.
- to try to trace new sources, if necessary,
- to keep reviews (statistics) of the supplied literature in his vocational area up-to-date, so as to obtain an insight into the composition and the interest-pattern of his user's circle,
- to test the eventual results by an active user's control.

Cooperators of TDCK contribute to a few cooperative connections, i.e.:

- the cooperating centers (documentation-pool) for mobile-transport documentation (SAMCAD)
- the cooperating technical-workshop documentation-services (SAWEDO)
- the central aircraft-documentation (CLD)

The two first-mentioned documentation-pools are very active. A distribution of the available magazines has been installed for the members of the pool. Each member performs the documentation-tasks from the allocated magazines.
The produced secondary information is then handed in, for the production of the joint literature-survey.
The actual production-costs, i.e. the type-work, the printing and the distribution of the literature-surveys and the index-cards for the separate catalogues, are being distributed amongst the members and accounted for.
The SAWEDO-literature-survey is distributed commercially.

The Central Aircraft-Documentation Office (CLD) is rather inactive. The cooperation mainly consists of the exchange of literature-surveys and then placing the literature at the member's disposal, free of charge, on demand, on a reciprocity-basis. To this group belong the KLM (Royal Dutch Airlines Company) in Amsterdam, Fokker in Schiphol-Oost, the Ministry of Traffic and Waterways in The Hague, the National Aerospace Laboratory (NLR) in Amsterdam, and TDCK in The Hague. TDCK is occupied with the secretarial-jobs of the aircraft-technical pool.

SERVICE-RENDERING, USER'S CIRCLE AND INFORMATION-SOURCES

TDCK aims at the objective to form and keep up-to-date a well-balanced literature-asset, so to say a literature-asset, which complies with the existing and excepted needs of the defence-organization. Attention is paid to such documentation-information', of which can be expected the following benefits, i.e.:

- that the subject will enjoy large interests in a wide circle, or can reasonally be expected to do so
- that new and scientifically sensible views are set to the object
- that pure- and/or applied scientific principles and starting points are being formulated, of which can be presumed, that they might become defence-relevant subjects in the future
- that can be assumed that the described applications, once introduced in, or further developed for the defence-organization, could lead to renewals or improvements.

These elements serve, separately or in combination, as selection-criteria.

TDCK distributes as a rule 21 literature-surveys every month, fabricated by the aforementioned disciplines and issued to draw the attention of the user's circle to recent magazine-articles and reports. Each literature-survey is sub-divided into 10-15 chapters and each chapter into 1-5 sub-chapters, generally speaking. The greater part of these surveys contains "unclassified" material. The literature-surveys for "armaments-technique" & "tactics and strategy" contain "restricted"-material and are classified as such. The "armaments-technique" is also distributed in a separate literature-survey for foreign distribution among the FINABEL-partners. At irregular times 2 "confidential" literature-surveys are distributed, containing:

- classified reports and articles, and
- Netherlands military-research reports-abstracts (especially for NATO-partners)

Also is issued an unclassified literature-survey, 3-times a year, about the subjects of library-documentation and information-technique.
Each literature-survey contains about 45-90 abstracts. The yearly production of TDCK is about 10.000 abstracts.
Bibliographies may be published for two reasons, i.e.:

- on demand, or
- for reasons of an extraordinary interest.

These bibliographies are also published in the literature-surveys, as well as in year-indexes, which are issued by some of the TDCK-disciplines.
All abstracted magazine-articles and reports mentioned in the literature-surveys can be supplied directly. Naturally reports, which will be issued on a loan-basis, are provided in the order of incoming demands, to which defence-organizationmembers have precedence. In exceptional cases several specimen of one report are kept in store, to shorten the waiting-periods.
Subscriptions to the several literature-surveys are open to members of the defence-organizations, exclusively for official duties, without charge, while they are being forwarded on demand.
Subscriptions for establishments, not belonging to the defence-organization, are being provided on a reciprocity-basis. On a limited scale against a small compensation, third parties can enter a subscription to one or more of the unclassified surveys.
In the defence-organization the authority to apply the Director of TDCK for literature and subscriptions to literature-surveys, free of charge, rests exclusively with directors, commanding officers and heads of establishments, units and services. They are also authorized to request from the Director of TDCK, on account of questions and problems arisen, to be provided with a literature-search, a literature-index of the titles or a bibliography about a certain subject of special interest. All this means to guarantee that the applications arise from a functional need.
Literature is generally applied for, by number or subject. The applicant receives a photocopy of the magazine-articles for keeps. The reports are being issued on-loan for a specific period.
As far as the reciprocity-basis is not concerned, a small fee is demanded from third parties for photo-copies and the loan of reports.
Next to the members of the defence-organization (Ministry, Navy, Army, and Air-Force), the laboratories of the Maingroup Defence-Research of the Netherlands Organization for Applied Physics-Research (HDO-TNO) also belong to the user's circle. In fact they also belong to the defence-organization. These laboratories often make use of the service-rendering by TDCK. In particular the selected reports-literature of TDCK is applied for by them.

The following laboratories belong to this group, i.e.:

- the Physics Laboratory-TNO at The Hague
- the Prince Maurits Laboratory-TNO at Rijswijk (Z.H.), inclusive the Institute for Chemical- and Technological-Research
- the Laboratory for Electronics Developments for the Armed Forces-TNO at Oegstgeest
- the Institute for Perception-Physiology-TNO at Soesterberg

With the TNO-Institutes of the Central Organization (CO-TNO) there exists a form of cooperation, as far as the concerned laboratory is geared to a defence-research.
As has been mentioned before, the asset of inland- and foreign-magazines of the Armed Forces-libraries is the largest documentary information-source. The magazine-subscriptions are being paid for by the establishment, department or service, to which the concerned library belongs.
TDCK only keeps up-to-date the Central Military Catalogue of these magazines and it has the privilege to receive the magazines on-loan first hand, to select the suitable articles.
To be able to have access to a harmonic composition of the total parcel of trade-journals, TDCK has another 150 subscriptions, exclusively for own use.
As the larger part of the documentalists have left the university-benches recently, and usually have a good entry into the university-libraries, a good cooperation with these libraries has been built up in the course of the past years. Literature, which is not available at TDCK, is scanned by them on the spot, with the expectation that publications, relevant to the defence-interests, will be selected.
Photocopies of these articles then serve as a mastercopy for further handling within TDCK.
The report-literature is obtained via exchange-agreements direct from inland- and foreign-institutes, free of charge, or against the prevailing prices.
From the Maingroup Defence-Research-TNO (HDO-TNO) one specimen of each newly published report will be obtained, as well as two extra copies to forward to the institute, with which an agreement is in force, such as DTIC and NASA. When such an agreement does not exist, reports will be exchanged on-demand on a reciprocity-basis with the institutes of the NATO-partners, such as:
DRIC, DOKZENT, CEDOCAR, DREA, CRDV, and others.
The requests are being transferred by TDCK to the TNO-organization, which sees to the further dispatch. Naturally the literature-surveys are being exchanged with these institutes.
Such is also the case with the Centro-di-Documentazione Scientifica della Difera.
Owing to the language-problem the useful effect for the Netherlands is practically nil.
The supply, c.q. acquisition, by TDCK of foreign reports and magazines takes place through diplomatic channels, or rather by intervention of the Dutch defence-attaché's in the prevailing countries.
This is a time-consuming procedure. In special cases a deviation from this course is possible and a faster delivery is assured. For the selection of reports use is made of the received abstract-journals and similar material.
This selection takes place with old, tried-out, manual methods and not yet with magnetic tapes or other modern aids.

RECENT INTERNAL DEVELOPMENTS

A preliminary investigation was started in the first quarter of 1980 to examine in how far the processes within TDCK could be used for automated processing.
It appeared that the documentative and administrative duties of TDCK are extremely time-consuming, caused by the following circumstances, i.e.:

- the repeated recording of data
- the manual search-methods and replacing of fiches in the file
- the absence of supporting matters, such as an automated procedure for statistic information, subscribers-assets and such
- the loan of reports
- the placing at the customer's disposal of photocopies of articles.

To prevent repeated recording of data as much as possible, TDCK already had 2-sets of HERMES WP 8000 wordprocessing-equipments since 1979/1980, which, however, were insufficient for the workload.

From the preliminary investigation resulted a task-instruction in 2 phases. At first, the development of the documentary part, focussed on "Storage and Retrieval", with the use of the softwareprogram "STAIRS" ("STorage And Information Retrieval System"). The 2nd phase, the automation of the administrative part, was to follow at a later stage. Because of other priorities, these duties have been postponed for two years already; it is expected that they will be taken up again in 1983. The automation of the documentary part of the duties can be described as follows:

By means of terminals, mounted in TDCK, the documentation-data are fed into the computer-system of the Defence Computer Center (DCC) of the Ministry of Defence.
The control of the text in the Dutch, French, English or German language and the redaction of this can be performed by the software-outfit: "Document Composition Facility" (DCF).

The administrative steering of the inserted data happens under the control of the software-outfit: "Document Library Facility" (DLF).
On behalf of the retrieval, the documented data are stored in the "STAIRS-data-base".
With the aid of "STAIRS" it is possible to retrieve data from the large collection in a conversational manner, by which various characteristics in different relations can be used as a search-profile.
The above mentioned software-programs and the necessary equipment were purchased to execute this project.

Since 22 April 1981 the "STAIRS-data-base" has been operational. Since that time the following processes are executed (see: Appendix III), i.e.:

- the input of data
- the manufacture of the literature-surveys
- the retrieval in the "STAIRS-data-base"

For the input of the data (see: Appendix IV), the documentalist composes a concept-fiche. A fiche contains all information, needed for the manufacture of the cumulative year-indexes, bibliographies and such.
The typist gets the model of a fiche on the display, for the input of the data (see: Appendix V - VII), which she fills up with data, according to the concept-fiche, drawn up by the documentalist.
The documentalist monthly gives the instruction to manufacture a literature-survey (see: Appendix VIII), thereby stating the numbers of the fiches, which have to be included. The system makes an assortment, according to chapter and subdivision and composes the literature-survey in this order.
The table of contents and the index to a set of three keywords, specially intended for the separate subjects, are added automatically.

The retrieval in the "STAIRS-data-base" (see Appendix IX), can be performed according to the "Search"- and to the "Select"-procedure. As a rule, firstly according to the "Search"-, and consequently, for refinement-purposes, according to the "Select"-procedure. In the "Search"-mode the complete text (as "free text") is searched in the "paragraphs", whereby the UDC-codes and descriptors can be used.
In the "Select"-mode, always a certain "formatted field" must be appointed, in which "operators" must be used, such as: LT ("less than"), EQ ("equal to"), GT ("greater than") and several others.

While searching in the manual-operated fiche-card-file, use was made of the UDC-codes and Thesaurus-descriptors, added to the fiches. These classification-procedures have been maintained in the automated system. The Thesaurus-classification system has been altered in so far, that specific descriptors are used and that the broader terms are not always incorporated. (In the manual-operated system this was strictly necessary).
The relation of the assigned descriptor towards its broader term is incorporated in the system by the software-technique, which is nominated by the manufacturer as: "Thesaurus Linguistic System" (TLD).
The transition from hand-operated to automatic system has been obtained with relatively few difficulties and problems.
The appearing imperfections in the programming-equipment and in the available apparatus do not come under the competence of TDCK, but under the responsibility of the Directorate-Automation of the Ministry.
The interruption-percentage was small; a total closedown has not happened yet.
Difficulties as regards the adaptation to the new circumstances have been very few.
The introduction happened in phases and each step was excessively explained to the concerned personnel, as happened already before with the transition to the wordprocessing-system.
The fact, that the personnel-members, occupied with the documentation-function, belong to the younger age-groups, and that the old system has been maintained completely with only strictly necessary adjustments, are the reasons which contributed largely to the very small number of difficulties, which took place in the transition to the automated system.
After over a year of practical experience can be concluded, that the automation has passed off smoothly.
In the delivery of literature-surveys, etc, no appreciable stagnations have occurred.
Meanwhile, the personnel-complement has been reduced with 3 persons, concerning the UDC- and Thesaurus-cardindex personnel.
It appears (after 1 year), that the necessary spaces for punctuation-marks have not been fixed optimally beforehand for some parts of the fiches (see Appendixes V - VII).
For certain parts the available space was not completely sufficient, so that restraint is imposed on the documentalist. In drawing-up the user's demand to the system, the consequences thereof have not been foreseen completely beforehand.
Adaptation to the corrected need is only possible, when the programming-equipment needs a service-overhaul.
It is the intention to be connected, via Euronet, to other data-banks in due time. The delay is caused by waiting for a central connection, which will be realized for DCC in the near future. It will then be possible to realize a connection with the already available display-terminals, without other additional equipment.
As the user's circle of TDCK prefers the handy hardcopy to the microfiche, as fas are report-literature is concerned, the largest part of the assets of TDCK consists of hardcopy-reports. These, of course, cover much of the available storage-space.

In the second half of this year however, transaction will occur to the acquisition of microfiches.
TDCK will then get at its disposal an "AM-Bruning 1830 Micropublisher Enlarger" (Printer) (see: Appendix X). With this equipment copies of the microfiche can be successively produced with a speed of 900 sheets an hour. A hardcopy will only be produced, once a rapport has been applied for; of a report much in demand, more copies can be produced without difficulty.
With this possibility a fast service can be assured against acceptable costs. The available budget for the acquisition or reports can then be spent to an optimal extent.

COST-ASPECT

In general it is rather difficult to calculate a cost-benefit-analysis for the activities, performed by a governmental establishment.
It is possible, though, to calculate to a certain extent the cost-accounting.
To convert the offered services into an amount of expenses is yet an unsolved problem.
Since a couple of years a calculation-method has been developed, incorporating norm-amounts, middle-sums, standard-amounts, real expenses, production-data and such, to be able to obtain a cost-insight of the spent amounts and the costs of the given services.
As an insight, a cost-indication follows next.
In one year 200 divers literature-surveys are published by the various disciplines, for which publications about 4000 subscriptions are booked. The attention of the user's circle is being drawn to 10.000 - 12.000 articles and reports. Yearly about 52.000 copies of magazine-articles and roughly 7.000 reports on-loan are being demanded for.
In about 550 cases a literature-survey is performed by the documentalists-informer, on behalf of questions by subject, problem and such.
The total expense-budget of TDCK is estimated at about 3,5 million Dutch guilders.
As an average, one specimen of each literature-survey roughly costs 50 guilders; a copy of a magazine-article 10 guilders and the loan of a report roughly 11 guilders. The answering of a question by literature-survey is calculated at 300 guilders, per question.
It can be concluded, that the setting-up of a documentation- and information-center asks for financial sacrifices, while the practical utility derived from it cannot, or rather, can hardly be made perceptible.
The interest of the user's circle is in some way a justification of the expenses made. Besides that, a wasteful growth of documentation- and information-services in the Armed Forces has been avoided.

REFERENCES

1. "Het Technisch Documentatie Centrum voor de Krijgsmacht"
door J.A. Schüller
in: Militaire Spectator, jrg. 125, nr. 2, februari 1956.
(The Armed Forces Technical Documentation Center, by J.A. Schüller,
in: Militaire Spectator, Vol. 125, (February 1956), no. 2 = (In Dutch).

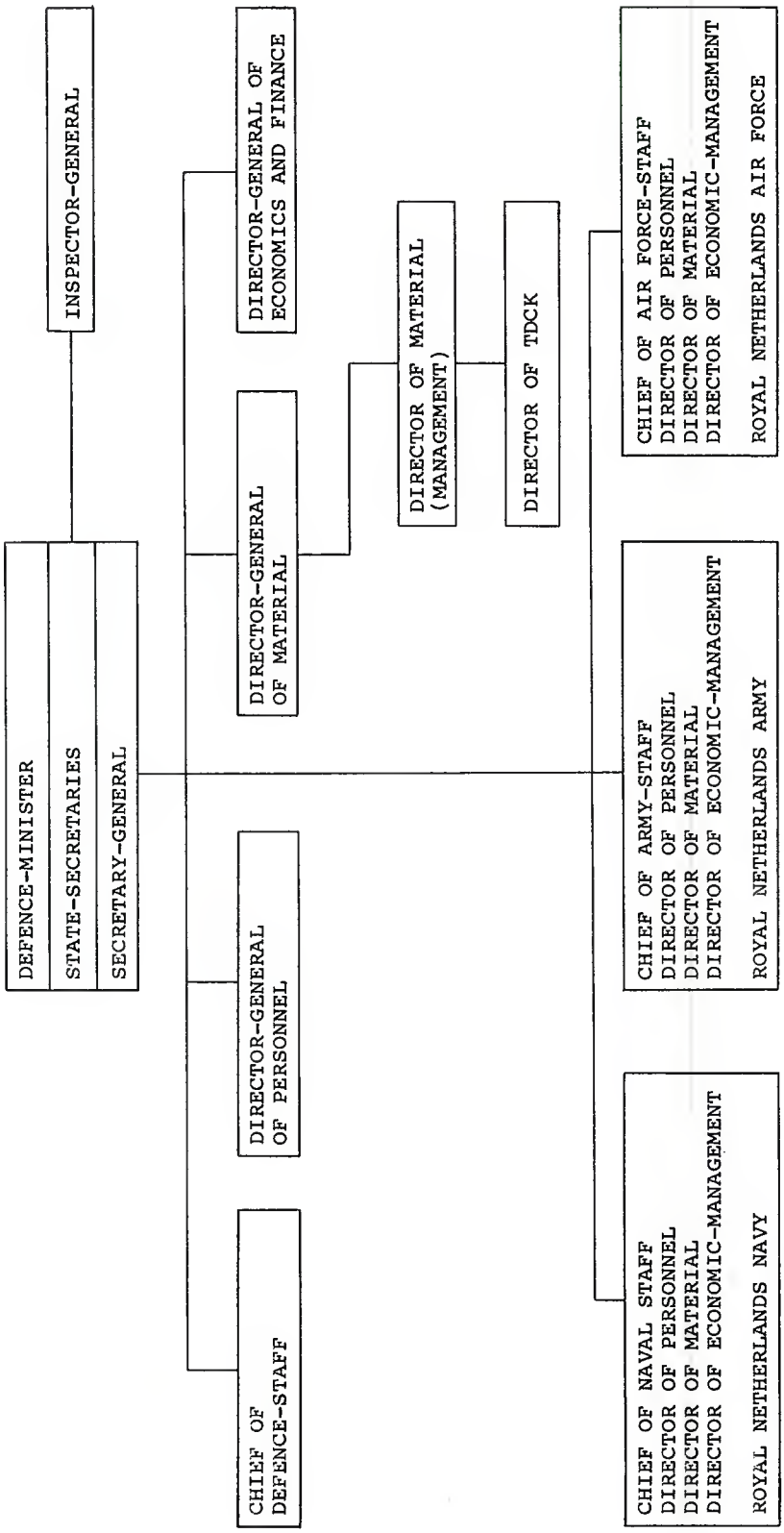
2. "Experience with indexing and retrieving by UDC and Uniterm",
by J.A. Schüller,
in: Aslib Proceedings, Vol. 12, no. 11, pp. 372-389.

3. "Netherlands Armed Forces Scientific and Technical Documentation- and Information-Center (TDCK)",
by Jack Backett, Fla.,
in: "Special Libraries and Documentation Centers in the Netherlands"
pp. 33-43.

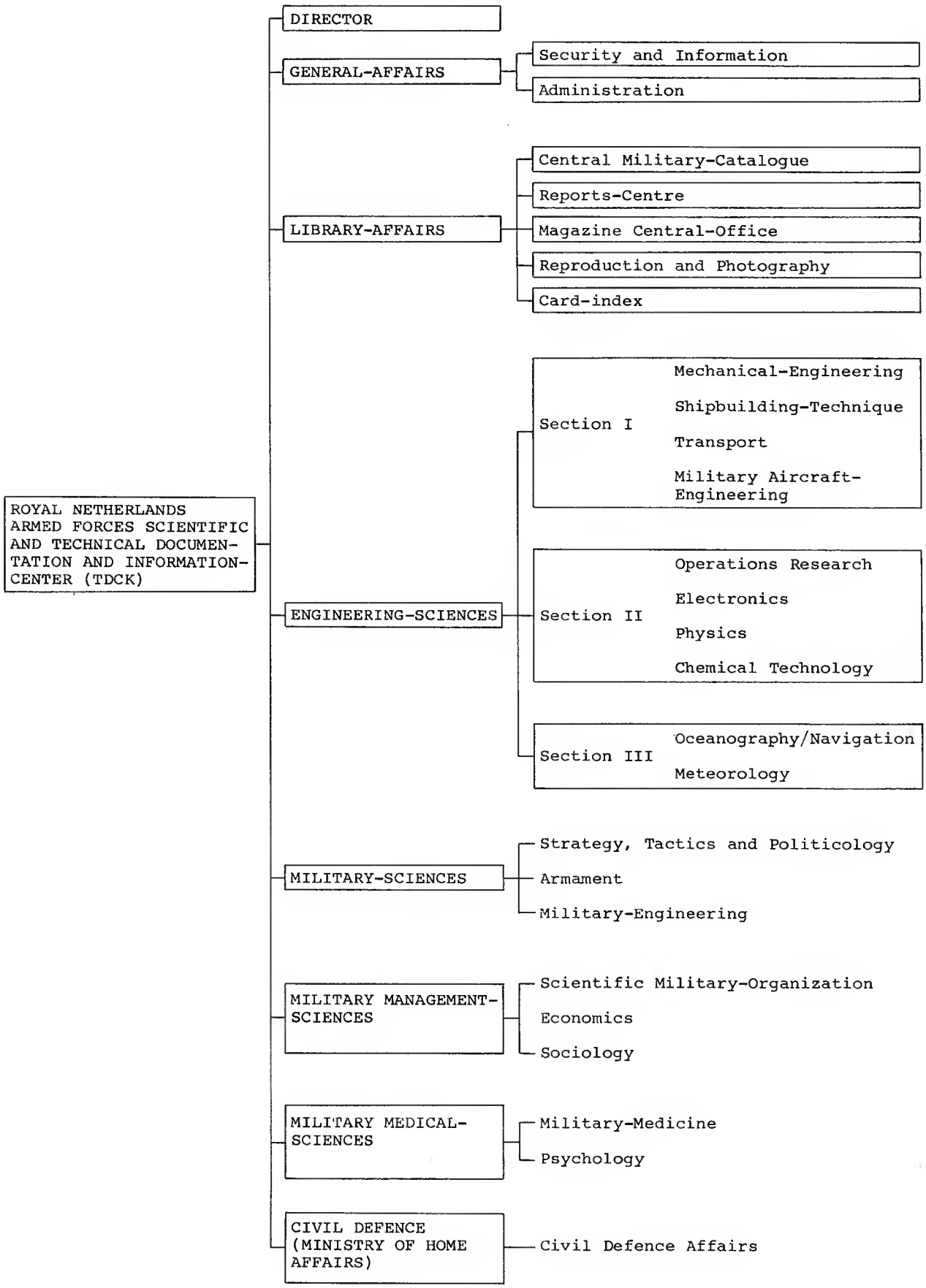
4. Brochure: "Wat doet het TDCK voor U"
(Brochure: "What can TDCK do for you") = (In Dutch).

5. "Rapport Vooronderzoek van het Project-TDCK" (Deel I),
uitgegeven door de Directie Automatisering/Ministerie van Defensie,
(Report: "Advance-research of the Project-TDCK" (Part I),
issued by the Directorate-Automation/Ministry of Defence (In Dutch).

APPENDIX I

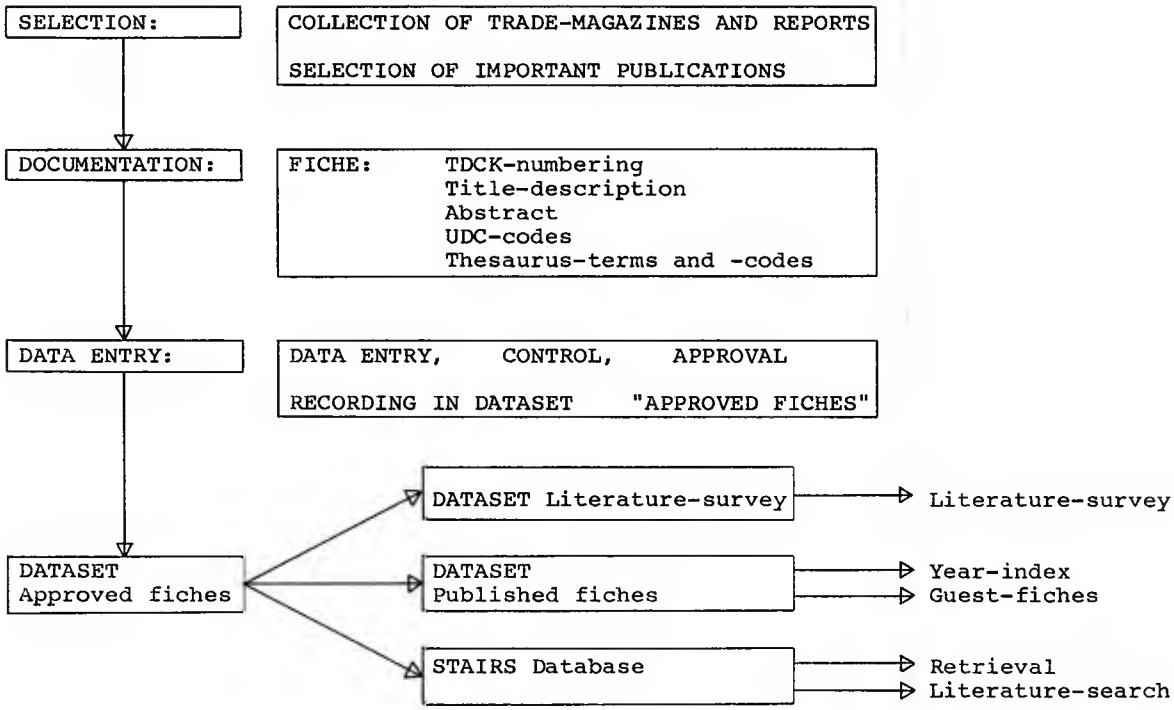

DEFENCE-MINISTER
STATE-SECRETARIES
SECRETARY-GENERAL
INSPECTOR-GENERAL
CHIEF OF DEFENCE-STAFF
DIRECTOR-GENERAL OF PERSONNEL
DIRECTOR-GENERAL OF MATERIAL
DIRECTOR OF MATERIAL (MANAGEMENT)
DIRECTOR OF TDCK
DIRECTOR-GENERAL OF ECONOMICS AND FINANCE
CHIEF OF NAVAL STAFF
DIRECTOR OF PERSONNEL
DIRECTOR OF MATERIAL
DIRECTOR OF ECONOMIC-MANAGEMENT
ROYAL NETHERLANDS NAVY
CHIEF OF ARMY-STAFF
DIRECTOR OF PERSONNEL
DIRECTOR OF MATERIAL
DIRECTOR OF ECONOMIC-MANAGEMENT
ROYAL NETHERLANDS ARMY
CHIEF OF AIR FORCE-STAFF
DIRECTOR OF PERSONNEL
DIRECTOR OF MATERIAL
DIRECTOR OF ECONOMIC-MANAGEMENT
ROYAL NETHERLANDS AIR FORCE

APPENDIX II


ROYAL NETHERLANDS ARMED FORCES SCIENTIFIC AND TECHNICAL DOCUMENTATION AND INFORMATION-CENTER (TDCK)
DIRECTOR
GENERAL-AFFAIRS
Security and Information
Administration
LIBRARY-AFFAIRS
Central Military-Catalogue
Reports-Centre
Magazine Central-Office
Reproduction and Photography
Card-index
ENGINEERING-SCIENCES
Section I
Mechanical-Engineering
Shipbuilding-Technique
Transport
Military Aircraft-Engineering
Section II
Operations Research
Electronics
Physics
Chemical Technology
Section III
Oceanography/Navigation
Meteorology
MILITARY-SCIENCES
Strategy, Tactics and Politicology
Armament
Military-Engineering
MILITARY MANAGEMENT-SCIENCES
Scientific Military-Organization
Economics
Sociology
MILITARY MEDICAL-SCIENCES
Military-Medicine
Psychology
CIVIL DEFENCE (MINISTRY OF HOME AFFAIRS)
Civil Defence Affairs

APPENDIX III

P R O C E S S



THE ELEMENTS OF A FICHE:

THESAURUS	descriptors and codes
UDC	codes
TITLE-DESCRIPTION	
ABSTRACT	

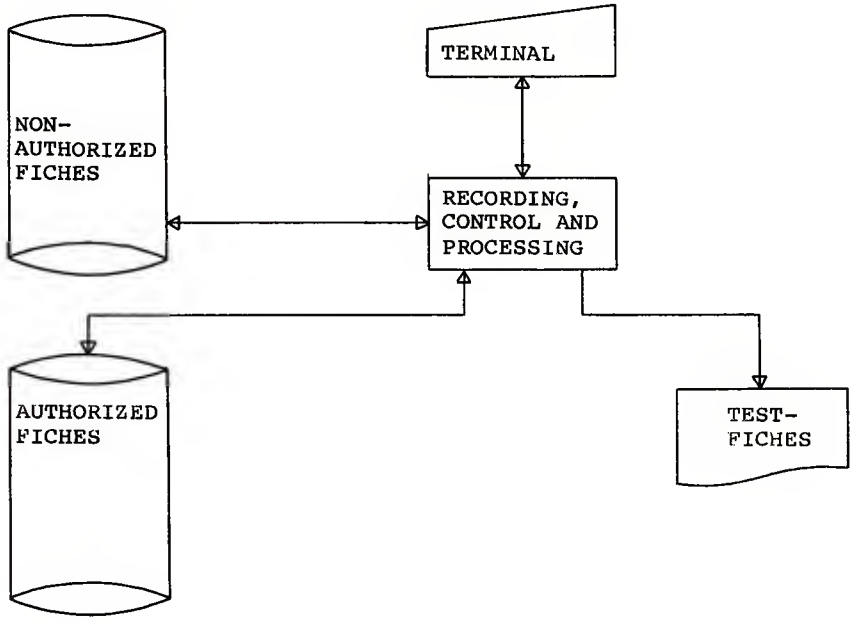
APPENDIX IV

SCHEMATIC REPRESENTATION OF THE DIVISION IN SUBSYSTEMS

The documentationsubsystem (DOC) consists of three subsystems:
(see also: Appendixes VIII and IX).

1. Fiche-recording - TDCK
2. Progress-report and publication - TDCK - (see: Appendix VIII)
3. Retrieval - TDCK (see: Appendix IX)

Fiche-recording - TDCK



APPENDIX V

MINISTRY OF DEFENCE	TDCK
DAUT	2.4.2.
DIRECTORATE-AUTOMATION	date leaflet: 2

25 February 1981

D I S P L A Y G R O U P I N G I

DOCUMENT-NUMBER TDCK: ---------- CLASSIFICATION: ----------

DESCRIPTOR	CIRCLE	CODE
----------	------	----
----------	------	----
----------	------	----
----------	------	----
----------	------	----
----------	------	----
----------	------	----
----------	------	----
----------	------	----
----------	------	----
----------	------	----
----------	------	----
----------	------	----
----------	------	----

DOCUMENTALIST: ---------- TYPIST: ---- DATE OF INTRO.: ------ SECTION: ----

UDC CODES: ----------

CHAPTER: ---------- LANGUAGE: -----

DIVISION: ---------- COUNTRY: ------

TITLE: ----------

------ PRIVACY CODE: ---

APPENDIX VI

MINISTRY OF DEFENCE	TDCK
DAUT	2.4.2.
DIRECTORATE-AUTOMATION	date leaflet: 3

25 February 1981

D I S P L A Y G R O U P I N G II

DOCUMENT-NUMBER TDCK: ---------- CLASSIFICATION: ----------

AUTHOR(S): ----------

SOURCE/CORPORATIVE AUTHOR-	SOURCE CODE	PUBLICATION-NUMBERS
----------	----------	----------
----------	----------	----------
----------	----------	----------

DATE PUBL.: ---- YEAR PUBL.: ---- NUMBER OF PAGES:---- NUMBER OF APPEND.: ---

ILLUSTRATIONS: ---------- NUMBER OF REFERENCES: -----

A B S T R A C T

APPENDIX VII

MINISTRY OF DEFENCE	TDCK
DAUT	2.4.2.
DIRECTORATE-AUTOMATION	date leaflet: 4

25 February 1981

D I S P L A Y G R O U P I N G III (M A G A Z I N E A R T I C L E S)

DOCUMENT NUMBER TDCK: ---------- CLASSIFICATION: ----------

AUTHOR(S): ----------

MAGAZINE CODE: ----- VOLUME/NUMBER: ------- NUMBER OF MAGAZINE-EDITION: -----

NAME OF MAGAZINE: ----------

DATE PUBLICATION: ---------- YEAR OF PUBLICATION: ----

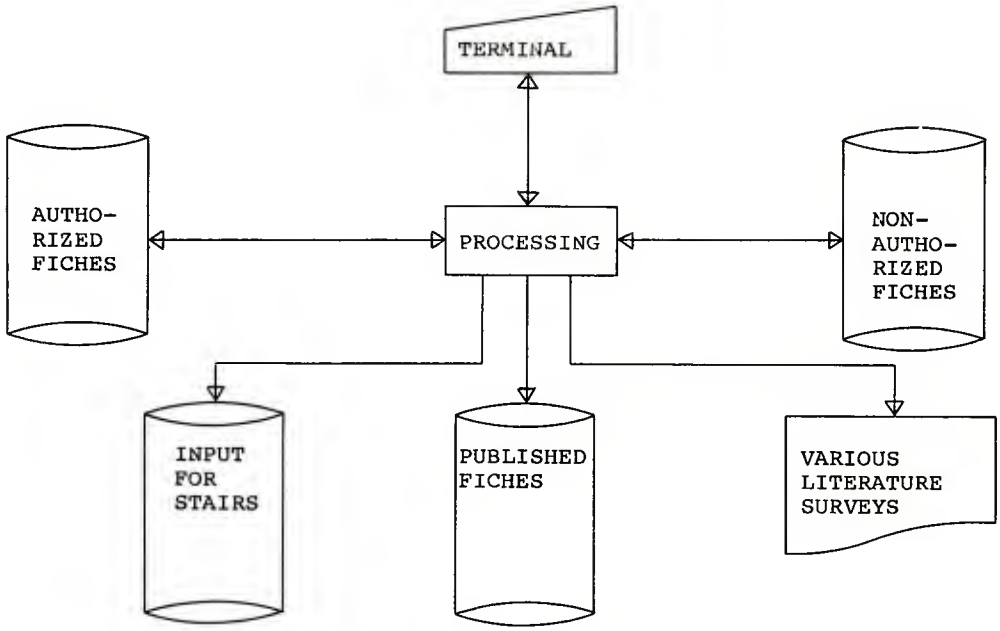
PAGE NUMBERS: ----------

ILLUSTRATIONS: ---------- NUMBER OF REFERENCES: -----

A B S T R A C T

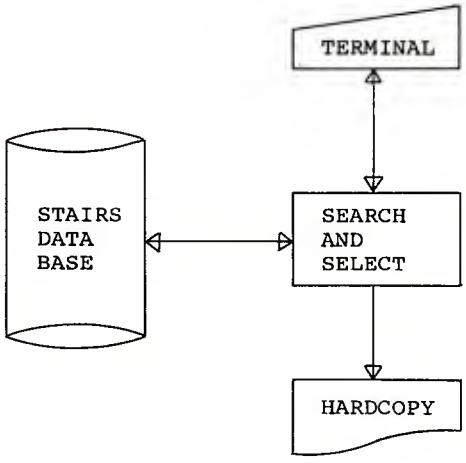
APPENDIX VIII

Progress Report and Publication TDCK



APPENDIX IX

Retrieval TDCK



APPENDIX X

BRUNING 1830

MICROPUBLISHER ENLARGER/PRINTER

The model 1830 Micropublisher, a plain paper microfiche enlarger-printer, is an information distribution unit designed to produce hard copy from all standard fiche reductions. The unit produces high quality, plain paper A4 copies at rates in excess of 15 copies per minute or 900 per hour. Normal usage levels are expected to be in the 30,000 per month range.

A free-standing machine, the 1830 accepts standard 105 mm x 148 mm silver, diazo or vesicular microfiche. The unit is manufactured to give the user any three of seven standard formats using reductions of 20x, 24x, 42x, or 48x. The acceptable formats are: 2060, 2063, 2498, 42208, 42325, 48720 and 48420. The resulting 'blow back' ranges from a ratio of 18:1 for the 20x reductions to 44:1 for the 48x mode.

Up to 2,000 sheets of plain or pre-printed paper may be loaded. The output receiver stacks up to 500 sheets of dry and completely fused copies in either separated or collate sets. Copy legibility is 6 point size for 24x reductions and 8 point for the 48 x mode.

Now you can extend the savings and operational efficiency of your microfiche usage by producing high quality, plain paper copies on the 1830 Micropublisher.

HIGH SPEED PRINTING
Over 900 pin sharp copies per hour.

LOW COST
Copies are produced at really low-cost.

CONVENIENT
Automatic set-up and operation.

AUTOMATIC COLLATED SETS
Print all, some or any one frame of a microfiche, the copies are delivered face-up.

MULTI-FORMAT
Load up to three microfiche formats into memory for printing.
The Micropublisher is designed to support a variety of printing needs.

INTELLIGENT CONTROL
Microprocessor technology monitors and controls all operator equipment functions.

HIGH-QUALITY OUTPUT
Letter-size copies are printed on plain or pre-printed stock with the quality you expect from plain-paper copier.

TECHNICAL DETAILS:

PRINTING SPEED:	Over 900 A4 plain paper copies per hour.
INPUT FORMATS:	Choice of any three microfiche formats from 2060, 2463, 2498, 42208, 42325, 42870 or 48420. The 1839 will accomodate negative or positive-appearing originals from silver, diazo or vesicular microfiche.
PAPER SUPPLY:	2,000 sheets of plain or pre-printed paper A4.
PAPER OUTPUT:	Up to 500 sheets of single document copies or fully collated sets delivered face up.
HEAT DISSIPATION:	5,100 BTU/Hour.
DIMENSIONS:	107 cm high x 131 cm wide x 70 cm deep.
WEIGHT:	250 kg.
ELECTRICS:	220/240V 50Hz, 12 Amp.

THE ITALIAN DEFENCE
SCIENTIFIC AND TECHNICAL DOCUMENTATION CENTRE

Col. Guido Morelli
Director
Centro di Documentazione
Tecnico-Scientifica della Difesa
Via Clitunno 33,00198 Roma,Italy

SUMMARY

The paper deals with the following subjects:

I. Short history of the Italian Defence Technical Scientific Documentation Centre with mention of difficulties encountered in its establishment.
2. Structure of the Centre, sectorial organization, staff consistency and qualification, administration.
3. Dependence, authority and tasks assigned to the Centre.
4. Structural and operational inconveniences that have marked the activity of the Centre since its establishment.
5. Present services acquired and offered by the Centre: sources of information, national and foreign; services offered to organizations within and outside the Italian Defence; exchange of information with other similar organizations, national and foreign.
6. Future services under development.
7. Problems still pending to be solved in future as: increase in work potential and autonomy; increase of information sources; effective coordinating action within the Italian Defence; increase of information exchange with similar organizations; association with a National Technical Information Centre, as done in other countries.

This paper is aimed at giving a necessarily short account of the Italian Defence Documentation Centre, from now on referred to as the Centre, its history, present performance and future expectations.

After an eight years association, including three years of leading responsibilities, it would be my pleasure and pride could I present a bright picture of the Centre effectiveness particularly when it comes to a comparison with similar agencies operating in other NATO countries. Unfortunately, things are not going so well; while my praise goes to the whole staff, always ready and enthusiastic in their efforts to improve, develop and rationalize the Centre activities, on the other hand I cannot help considering the poor goals reached so far on account of many factors negatively affecting the Centre operation, not last an old fashioned burocracy, work potential below minimum and probably a not yet fully emerged conscience of the role of technical information as a profession.

The Centre came to life in I97I following a NATO recommendation, with a long gap in between the reasons of which are not in my records but I should think very few were aware at the time of the use of such an establishment at the top of the Defence structure. When finally rather individual efforts succeeded in getting approval, it was made clear that the Centre had to be of small size, not particularly engaging in budget and in personnel professional qualification. In my opinion it was an inadequate step but it might have proved acceptable just as a start provided substantial changes would intervene later on, following a mature definition of involvements and related requirements. This has not happened and twelve years later we are facing the same inconveniences.

The scarce potential assigned was to be increased, in the plans, by way of a very close cooperation between the Centre and the documentation branch of the Italian National Research Council; the two parties should have become associated in a complementary system still retaining each one its own identity and management. There were talks and assurances of the agreement at fairly high level. But some change of policy resulted in a break of negotiations just as the Centre was being established; so the ambitious goal, the feasibility of which remains doubtful to me, was definitely given up.

The Centre then, having missed the opportunity of becoming a component of a composite entity with a national scope, was made a branch of the Defence Technical Scientific Council in a position of quite indipendent technical management and initiative but fully dipendent in expenditures. And spending procedures were soon to become a burdensome factor of restraint in creating basic services, from document achievement to document announcement and reproduction up to the very costly computerized data processing. In this respect, I must emphasize the fact that the Centre has ever relied, for most aspects of its work, on external private collaboration involving a number of agreements where commercial current rules do not easily accord to government rules.

Going back to history for a moment, may I add that in 1979, the Centre left the Defence Technical Scientific Council and was transferred to the ministerial area under the authority of the Ministry of Defence Secretary General. No noticeable changes have intervened in the Centre operation apart from some initial difficulties in adapting to the new environment.

Now I would like to outline the Centre sectorial organization and tasks assigned. There is a Secretariat with a staff of three and general commitments. Then we have three small branches or, as we call them, sections. The first is in charge of document acquisition with a staff of six; the second deals with computer data processing and has a staff of three; finally the third section is in charge of information dissemination with a staff of four. One can realize from the figures the level of performance and output we can decently ask for from these rather embryonic bodies; not only the amount but also the quality of work, in terms of services rendered, is necessarily of low rate. All the same, our statute dictates that the Centre should:

- coordinate technical information and documentation within the Defence;
- establish relations with other agencies, national and foreign, military and not, in order to promote exchange of information and documentation;
- periodically inform, Defence in the first place, of the availability of all potentially interesting documents;
- provide, on request, pieces of information about specified subjects;
- supply, on request, full text documents.

How did we and do cope with these generic and at the same time ponderous responsibilities? What the Centre did as a start, lacking any previous experience, was to have a look at what other Defence Documentation Centres abroad were doing and analize how to match their standard. Of course, it existed a state of extremely limited capability in our structure so, while willing to perform in accordance with commitments, it was decided to give up any sophisticated systems. Naturally, it was basic to build up a significant collection of technical documents from every possible source, Defence included, and to keep it updated. After careful evaluation, classified documents were excluded.
It was also basic to produce some system of announcement for documents being periodically acquired and some other system to inform, on request, of all documents in the collection. In both cases the information should be selective as far as possible and detailed as far as possible; it might be in the traditional printed version for updating purposes but resulting from a computer output when applied to the whole stock of documents.
Finally, document reproduction facilities were to be organized, able to work both with microfiche and paper formats. All in the light of the coordinated efforts within the Defence area enunciated in our statute and of the authority generically assigned to the Centre of piloting such coordinated activity. How did we manage to solve these problems? And were we successful? Let us see point by point.

First point: document acquisition. If I refer to Defence documents, the scene appears quite empty. Probably the Centre did not deal with the business properly, probably it looked as a true second job to many Defence document producers, certainly there was a lot of scepticism and, why not, of violated privacy. After an apparently promising start, the flow of technical documents rapidly dropped to insignificant values and such it is still to-day. In other words, the Centre is being deprived of any chance to exchange documents of military origin with the rest of NATO Defence Documentation Centres. It is a very serious matter to be taken into account; we will have to point out that, while it is our duty to support the Defence in their studies, we cannot be limited to a "one-way" flow of documentation but must also act as a referral point of Defence produced documents or we would have failed in one of the major applications of the "coordination within Defence" dictate.

As for other sources, the range is not very wide. I would list them as follows:

- a number of periodicals, about a hundred, carefully selected still not always up to our expectation because flooded with advertisements. They provide an annual output of about 4,000 technical articles;
- stocks of documents from the U.S. National Technical Information Service by effect of a Selected Research in Microfiche formula. Annual amount is an average 14,000 documents;
- other documents we get in Italy or abroad, not exceeding an annual figure of 3,500 items.

Summing up, I would consider 21,000-22,000 documents being achieved each year on the whole. Only a small minority are free of charge thanks to exchange agreements. The rest have to be bought, sometimes at high price as we all well know.

Acquisition of documents of technical or scientific content poses many problems to us such as:

- how to judge their value to the Defence? It is a difficult job that we perform as a team including three young analysts fresh from university and all senjor officers in the Centre with their long matured experience; still we accept a 10% of documents to present only a marginal interest which, I believe, is natural of a bulk work;

- how to pay documents? Budgetary restrictions and inadequate spending procedures make this problem a major one. As an instance, payments abroad must be executed through private agencies or through Military Attaches, by time consuming steps.
- how to make documents written in a foreign language accessible to our customers? Translation problems and costs are overwhelming, we just cannot cope with them, so documents are furnished in their original language but then we have to limit our selection to a couple of languages and even so there is bound to be a loss of requests.

Now I come to the next point, that is document reproduction.

We own machinery for every kind of reproduction. Our document collection is basically all in microfiche format and we are trying to generalize the use of microfiche at customer level since it is cheaper, quicker and more compact. On the other hand, the majority of our customers still do not avail themselves of microfiche readers-printers and consequently are pressing for paper reproduction which, as we all know, is becoming unbearably expensive. The point is that use of microfiche for office practice is not yet a reality in this country and in most cases it is not worth getting the proper apparatuses just for documentation purposes. So it happens that the Centre cannot define the desirable reproduction technique and policy; sometimes has to negate voluminous documents proving exceedingly costly in paper copy. Apart from that, many other problems arise when we talk of reproducing documents. Replacement of obsolete or worn out machines takes years; personnel is always under requirement in number; reproduction materials are limited by their cost. I forget to say that all services addressed to Defence customers are free of charge.

And I shall now touch the last point, document announcement.

For years now the Centre has been issuing a monthly Bulletin titled "Bollettino Segnaletico di Documentazione" as a traditional announcement tool and we are not going to replace it very soon. In fact it seems to be working quite well for updating purposes.It covers bibliographic data and short abstracts. References are grouped by subject in the COSATI classification. The Bulletin contains information about the latest arrivals at an average monthly rate of I,700-I,800 references. Currently we issue 230 copies a month.We have problems, instead, with what are commonly known as retrospective searches. Our collection of documents, ten years old now, is made up of two hundred and fifty thousend items; probably not a big one but all the same difficult to be used selectively in a traditional way. Full texts are ordered by a sequence number only and selection has to be done through the Bulletin references picking them up in a tiresome endless fashion; an old library would probably be more advanced. Even worse, results seem to be rather casual when the subjects are composite and detailed ones.

Thus the Centre has started an approach to computerized management of references in the effort of building up a simple but effective information retrieval system.
We have been dealing with the project for sometime, busy overcoming a number of obstacles like how to get computer support, since we could not foresee a computer facility of our own, how to carry on recording procedures and, in the end, how to exploit the resulting bibliographic file by a properly trained staff. The situation seems to be favourably oriented and we hope to enter an experimental operational fase at the beginning of next year. One of the Defence Data Processing Centre is providing computer support and a terminal. We have matched market software programs to our requirements and have committed a bulk storing of all references matured in ten years time to a private service. For update storing we might consider a joint effort of Centre personnel with a minimum of unavoidable external contribution, possibly inside the Defence data processing organization.
To carry on searches, we think we might rely on our three analysts.

If the Centre is to remain in its present consistency, we do not foresee much development in information retrieval. There is a trend to the execution of relatively few costumerized searches, as personnel time capability commands, but the number might increase if we renounce a high degree of selectiveness and pertinence which, after all, will not be so bad if it means that the pertinent references are all there with something more.

It seems to me that I have covered the major points of the Centre past and present events. I can only add, for statistics sake, that we have some I50 regular customers. Most of them are Defence offices institutionally devoted to studies and research; a few are government or private institutions willing to cooperate in exchange of information. Our annual document delivery reaches an average of 6,000 items.

To conclude, what may we expect from the future? I would fancy a new structure of the Centre, with increased staff and not slightly increased, better defined personnel qualification, more freedom of spending, smoother procedures in every field of action. Unfortunately, the moment we live in does not appear in a favourable light neither does the near future; very easily, we will have to do with what we own for long. But even so, it

is the Centre duty finding ways of improvement. Our preminent position and authority in the Defence technical information area should be adfirmed and made work; from there, the establishment of a coordinated Defence information system should be tried with the Centre as a pivot but sharing the burden of responsibility with any other sectorial documentation branch operating in the Defence area. Availability of Defence produced technical documentation will put the Centre into its logical function, also acting as a qualifying factor of exchange and so, in the end, bringing benefits back to the Italian military research community. We should, in parallel, try and standardize document reproduction techniques with a final aim at the generalization of microfiche format use. It is not a minor point as it might appear, at least not for us. In an only-microfiche reproduction system there is bound to be a precious saving of money and manpower, just what we terribly need.

But, of course, our most suffered expectation, I say suffered and I mean it, is the completion of our bibliographic data file with the consequent start of a computerized information retrieval activity. It is not only the thought of a real new service rendered to make me so keen; I feel the Centre will get a new dignity and qualification from it and will very probably be able to speak in a louder voice when stating its title to a top position and asking for means apt to actually materialize it. Finally, we share one more expectation with the majority of the technical information community in Italy. I refer to the long dreamt of national information service at government level with which all smaller agencies wishing to could establish links of cooperation and mutual support. It will take much courage and enterprise, it will require stable government decisions but I trust sooner or later it will be there. The Centre looks at this desirable event with much hope.

ORGANIZATIONAL STRUCTURE AND OPERATION OF DEFENSE/AEROSPACE INFORMATION CENTERS IN THE UNITED STATES OF AMERICA

by

Hubert E. Sauter *
Defense Technical Information Center

and

Louis N. Lushina **
National Aeronautics and Space Administration

SUMMARY

This paper, prepared jointly by the Defense Technical Information Center (DTIC) and the National Aeronautics and Space Administration (NASA), addresses U.S. Government aerospace and defense information centers. Discrete sections of the paper describe DTIC and NASA in terms of their history, operational authority, information services provided, user community, sources of information collected, efforts under way to improve services, and external agreements regarding the exchange of documents and/or data bases. Contents show how DTIC and NASA provide aerospace/defense information services in support of U.S. research and development efforts. In a general introduction, the importance of scientific and technical information and the need for information centers to acquire, handle, and disseminate it are stressed. The paper concludes with observations that have been drawn from U.S. experience in operating these centers.

INTRODUCTION

During the late 1950s and early 1960s, the United States became increasingly concerned with the vital role played by science and technology, not only in the nation's economy and welfare, but also in national security. A subcommittee of the Senate Committee on Government Operations conducted a long, interrelated series of studies and hearings dealing with the management of scientific and technical information (STI). In 1961, they reported "precipitous R and D growth" but "no complete inventory . . . of the Federal Government's program in research and development . . . ." The late Hubert H. Humphrey, then a U.S. Senator and Chairman of the Subcommittee on Reorganization and International Organizations, opened the 1961 report with a straightforward statement that included the following:

> The initial aim of research and development is to generate helpful information. If good scientific work is done, but information does not flow promptly about it and from it, much of its value may be dissipated.
>
> Information is the crucial means to the end. The goal is progress in military and civilian scientific technology. The means is the circulation of facts about how this goal is being approached. Throughout the process, the management of information may crucially affect how fast and how well successive aims are reached.[1]

Mr. Humphrey played a major part in convincing federal agencies to institute STI programs to avoid overlap and duplication of federal research and development (R&D) programs.

In 1963, the President's Science Advisory Committee observed that communication is an essential part of research; if an agency sponsors research in support of the agency mission, it ought also to allocate resources to support the communication necessary for effective conduct of that research.[2] In 1965, a report produced for the Committee on Scientific and Technical Information (COSATI) restated this principle as follows: "the development of scientific knowledge depends on the communication of new theories and new experimental observations to others."[3] To accept this point of view was (and is) to recognize the essentiality of effective information management in S&T progress and in the efficient use of R&D resources.

During 1963 and 1964, the Department of Defense (DoD) and NASA made important advances in STI management. In 1965, the Committee on Government Operations reported gains by "the Federal Government's largest program of science and technology information" and cited cooperation between DoD and NASA as "the most important bilateral information effort in the Federal Government today."[4]

* Administrator, Defense Technical Information Center, Cameron Station, Alexandria, Virginia 22314, USA

** Assistant Associate Administrator for Management, National Aeronautics and Space Administration, 600 Independence Avenue, S.W., Washington, D.C. 20546, USA

The 1965 report generated from a COSATI study of national S&T document handling systems analyzed plans and proposals that preceded it.[3] According to that report, the S&T information and documentation problem had several components.

S&T INFORMATION/DOCUMENTATION PROBLEMS

(1965 COSATI REPORT FINDINGS)

- Increasing numbers of users and user requirements.
- Increasing numbers of documents/information.
- Difficulties in the existing system (which consisted of many independent units)
- Non-application of new technologies.
- Insufficient long-range planning.

The study recognized "a need for the development of national policy regarding S&T information and documentation problems," arrived at the assumption that "information centers are a permanent part of any national system(s) for handling scientific and technical information," and recommended "a national document-handling system in science and technology."

More recently, government budget restraints have prompted studies aimed at quantifying the value of information services. One such study was done by King Research, Inc., and involved an analysis of Department of Energy (DoE) data base products and services.[5] The study calculated that $2.8 billion of savings could be attributed to the existence of the DoE products and services. Based upon DoE's R&D budget for FY 1981, that research savings amounts to about a 68 percent increase in productivity. Studies like this indicate that money appropriated for technical information services has a large return.

PART A

DEFENSE TECHNICAL INFORMATION CENTER

I. HISTORY

The Defense Technical Information Center (DTIC) was established to support Defense-related research, development, test, and evaluation (RDT&E) activities. Its history can be traced back to 1945 when captured technical documents were acquired by the Air Documents Division of the Air Materiel Command Intelligence Department. Two years later the Central Air Documents Office was formed.

In 1951, Secretary of Defense George C. Marshall combined Air Force and Navy efforts to establish the Armed Services Technical Information Agency (ASTIA) to serve all three military departments and their contractors. By 1963 there were 700,000 titles in ASTIA's collection (with more than one million annual requests for documents); at that time, operational control for ASTIA was transferred to the Defense Logistics Agency (DLA) under the policy guidance of the Office of the Director of Defense Research and Engineering (ODDR&E); and ASTIA became the Defense Documentation Center (DDC).

In 1979, DDC's name was changed to DTIC to symbolize an expanded mission that includes providing direct information system and data base support to the Office of the Under Secretary of Defense for Research and Engineering (OUSDR&E) and to Principal Staff Assistants of the Office of the Secretary of Defense (OSD) in coordinating the overall Scientific and Technical Information Program (STIP).

II. OPERATIONAL AUTHORITY

DTIC is under the operational control of the Director, Defense Logistics Agency, and under the policy guidance of OUSDR&E. In 1962 Dr. John S. Foster, then Director of Defense Research & Engineering (DDR&E) (OSD), established the position of Director of Technical Information which was the focal point for detailed policy guidance to what was then DDC. This position is known today as the Director of Research and Technical Information in ODUSDR&E.

On October 2, 1981, a DoD Directive on the subject of STIP was signed into effect (DoDD 5100.36).[6] This directive prescribes composition and policy of the STIP; defines a program for carrying out OSD's responsibility for the STI function; and outlines DTIC's mission, responsibilities, and functions.

DTIC FUNCTIONS

- Centralized DoD Document Services
- Centralized DoD Data Base Services
- DoD Information Analysis Center Support
- DoD Technical Library Support
- Application of Advanced Information Science and Technology
- Related STI Support Services

DoD directives[7-11] require that each R&D project and work effort be documented in a standardized format including relevant information such as objective, approach, and conclusion.

DOD DIRECTIVES/INSTRUCTIONS

- DoD Directive 5100.36, Defense Scientific and Technical Information Program
- DoD Instruction 7720.13, Research and Technology Work Unit Information System
- DoD Instruction 7720.16, Research and Development Planning Summary (DD Form 1634) for Research and Development Program Planning Review
- DoD Instruction 5100.66, Establishment of Policy for, and Administration of, Independent Research and Development Programs (IR&D)

III. INFORMATION SERVICES PROVIDED

DTIC provides its registered users with a wide range of products and services from the following four major data bases it maintains for DoD.

DTIC'S MAJOR DATA BASES

- R&D Program Planning (R&DPP)
- R&T Work Unit Information System (R&T WUIS)
- Independent Research and Development (IR&D)
- Technical Reports (TR)

The R&DPP data base contains program planning management information at the project and task level.

SAMPLE R&DPP DATA ELEMENTS

Program Element/Project/Task Area Number
Title
Responsible DoD Organization (Name and Address)
    Responsible Individual
    Telephone Number
Objective and Approach
Plans
Programs and Accomplishments

The Work Unit Information System data base is a collection of technically oriented summaries that describe research and technology projects currently in progress at the work unit level. Information includes the what, where, when, how, at what costs, by whom, and under what sponsorship research is being performed.

SAMPLE WUIS DATA ELEMENTS

Title
Performing Organization
Principal Investigator
Descriptors
Program Element/Project Number/Task Number
Objective

The IR&D data base contains descriptions of the technical programs being performed by DoD contractors that are not wholly funded by DoD but that are considered proprietary information and exempt from disclosure under the Freedom of Information Act.[12]

SAMPLE IR&D DATA ELEMENTS

Project Number/Title
Organization
Problem
Objective
Approach
Progress

The TR data base is a collection of bibliographic citations to formally documented scientific and technical results of Defense-sponsored research, development, test, and evaluation. These reports are assigned an AD (accessioned document) number for announcement, retrieval, and request purposes and are categorized by subject into a two-level arrangement consisting of 22 major subject fields and 188 related subject groups. DoD was instrumental in the COSATI development of field and group codes. These provide the basis for subject grouping of reports for announcement and distribution purposes.[13, 14]

SAMPLE TR DATA ELEMENTS

Report Number
Title
Author
Performing Organization Name and Address
Distribution Statement
Key Words
Abstract

Figure 1 shows the number of records in DTIC's four data bases. Figure 2 shows input figures for these data bases for the past 6 fiscal years. Total input into the systems has increased by 17% during that period.

There are three basic ways to access these data bases.

PRODUCTS AND SERVICES

- Demand
- Automatic
- Defense RDT&E On-Line System (DROLS)

DEMAND SERVICES

DTIC fills requests for technical reports in both paper copy and microform on demand. (See Figure 3, TR Hardcopy and TR Microform.) Demand bibliographies which list technical reports related to a specific subject are also conducted at the user's request. To prepare these bibs a computer search is made of the TR data base and reports that fit parameters of the search are listed with control numbers, abstracts, and other descriptive data. (See Figure 4, Custom Bibs.)*

Management information reports are similarly provided on demand but the search involves one or more of the three management data bases (WUIS, R&DPP, and IR&D). (See Figure 5, Custom Bibs.)*

Reference services include the assistance DTIC provides users and others in identifying documents and in locating a source for documents that DTIC does not have.

AUTOMATIC SERVICES

Registered DTIC users receive DTIC's TR announcement publication, the Technical Abstract Bulletin (TAB), automatically. Published every 2 weeks, TAB lists new classified and unclassified/limited scientific and technical reports accessioned by DTIC during the processing cycle. Reports are grouped into the subject fields and groups mentioned earlier. TAB is available in paper copy, in microfiche, or on magnetic tape. Because of the nature of defense programs and the reports these programs generate, distribution of TAB is limited.[15, 16]

TAB Indexes are issued with TAB to assist in identifying accessions of particular interest. There are seven TAB Indexes arranged by the following: Corporate Author-Monitoring Agency, Subject, Title, Personal Author, Contract Number, Report Number, and

* On Figures 4 and 5, "Remote Batch" reflects cases where users generate a bib on line but request that it be printed at DTIC and mailed to them. The "Direct Responses" category represents those instances in which the user's needs are satisfied completely by the printout generated on line at the user's site.

RECORDS IN DTIC DATA BASES

AS OF 31 MARCH 82

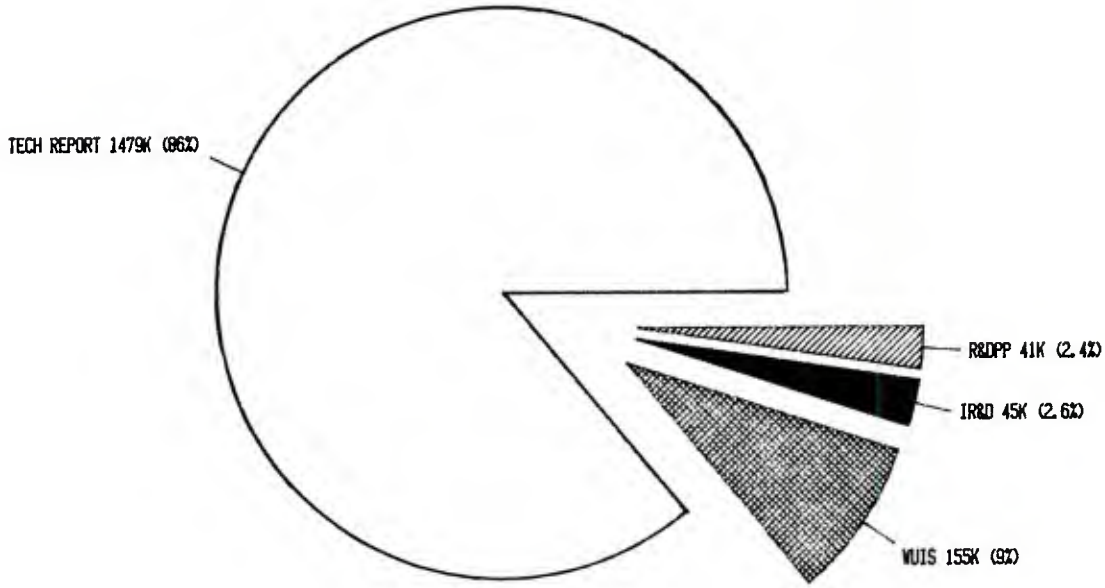


Fig. 1

INPUT TO DTIC DATA BASES

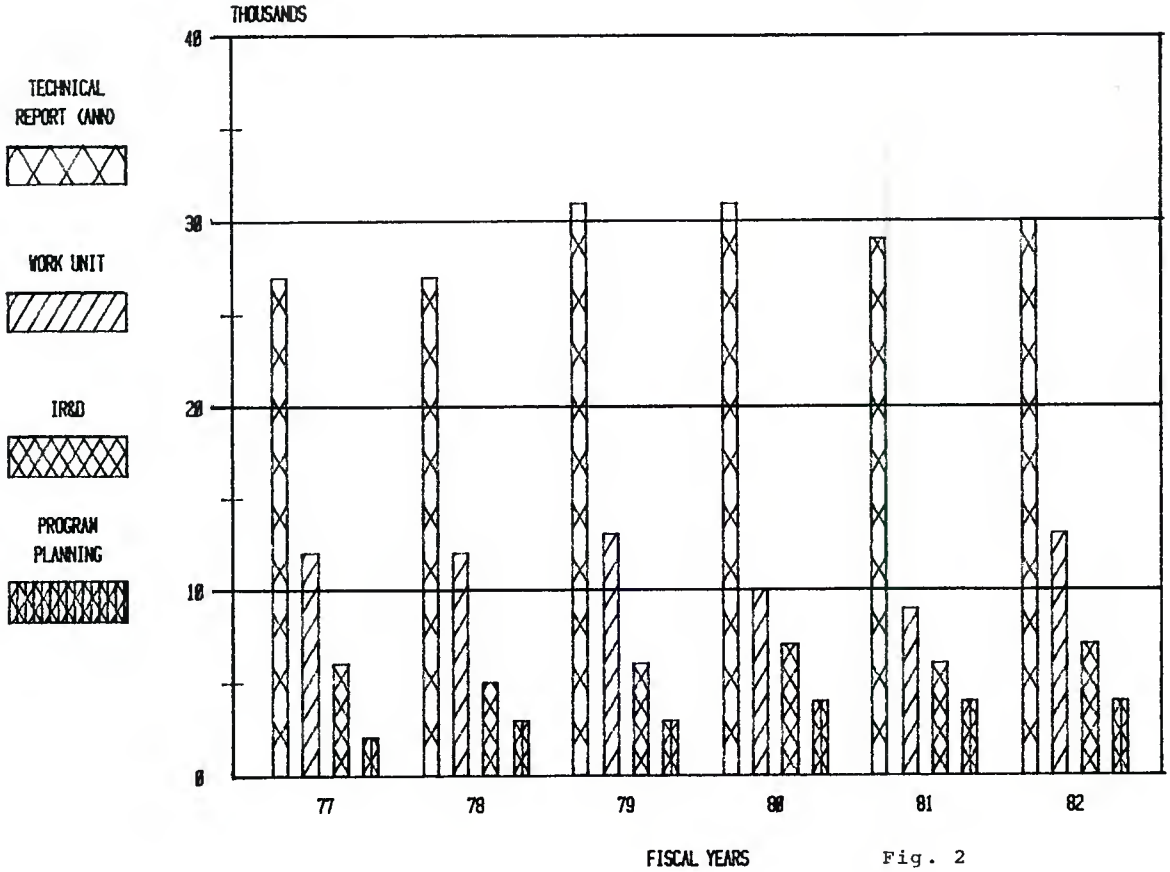


Fig. 2

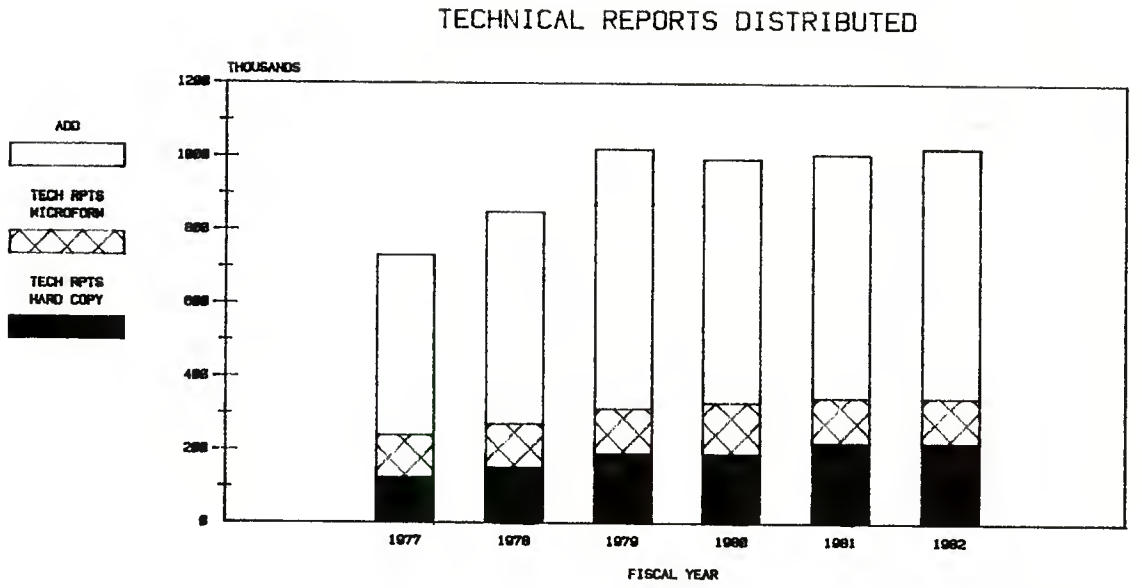


Figure 3.

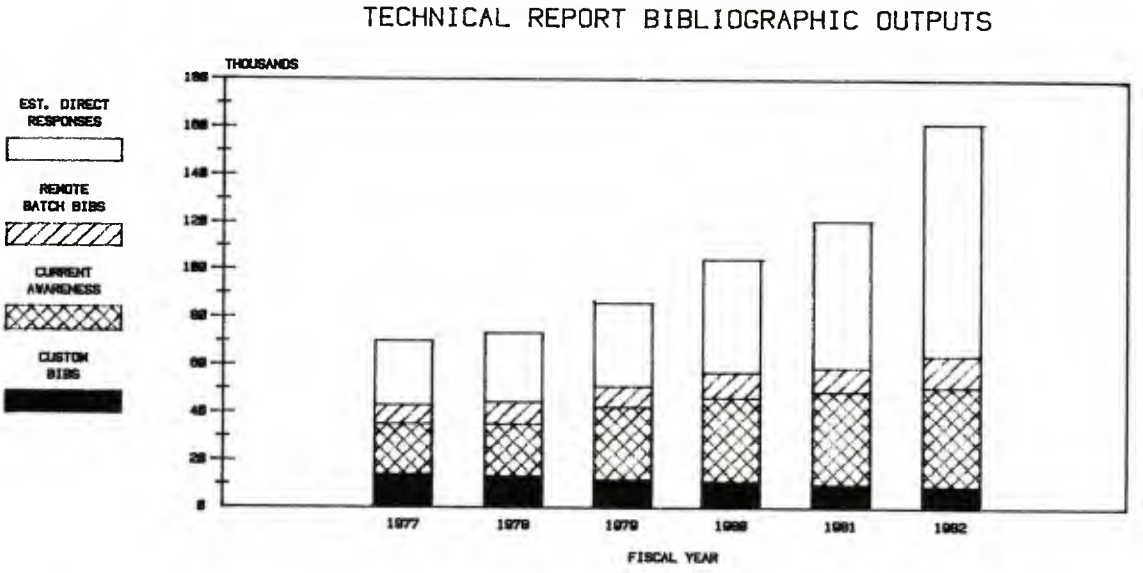


Figure 4.

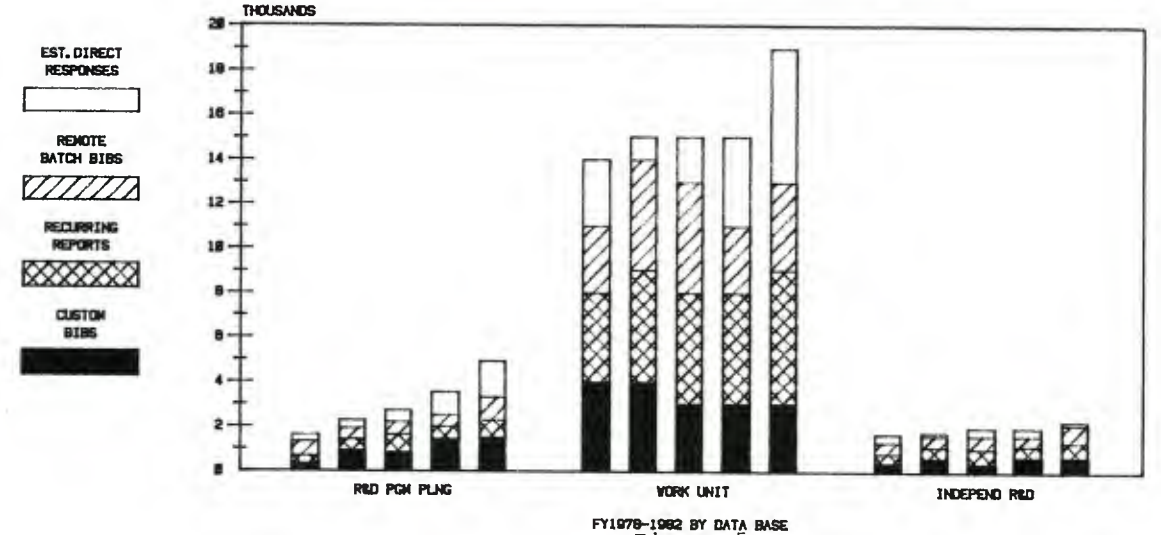


Figure 5.

Release Authority. Each report entry lists the AD number and the subject field/group where the complete announcement appears in TAB.

Every 2 weeks the Automatic Document Distribution (ADD) Program provides microfiche copies of newly accessioned technical reports to program participants by comparing a subject interest profile they have established with recently acquired reports. (See Figure 3, ADD.) The charge per report provided is one-third the demand cost.

DTIC's Current Awareness Bibliography (CAB) Program also uses a subject interest profile to determine which documents accessioned during the previous 2 weeks fall within the scope of a participant's recurring subject needs. A paper copy bibliography is generated automatically and sent free to DTIC registered users. Figure 4 shows the success DTIC has had increasing these automatic, and less costly to generate, products.

Recurring management information system reports are compiled monthly, quarterly, semiannually, or annually from the Work Unit, Program Planning and Independent Research and Development Data Bases. Formats for the automatically issued, profile-based reports are designed by the recipient organizations. Search profiles are kept on a master file which is updated monthly to make changes or modify the profiles for individual reports. Figure 5 shows the numbers of Recurring Reports generated by data base for the last 5 fiscal years.

DROLS

The DROLS network links remote terminals scattered from coast to coast to DTIC's central computer in Alexandria, Virginia. Typically, terminal sites consist of a cathode ray tube (CRT) data entry and display unit and a page printer. A magnetic tape cassette system is also available for use with the terminal. Users query the system by typing commands and appropriate data on a keyboard associated with the CRT. Users may switch from one data base to another in pursuit of information; they may activate the page printer to print out a paper copy of the CRT display, or they may record information on a tape cassette system for later review and printing.

Remote terminals offer users immediate access to relevant information. They can order bibliographies, management data reports, and technical reports directly from their terminals. Current and proposed terminal stations include the Deputy Under Secretary of Defense Research and Engineering (Research and Advanced Technology); Army, Navy, and Air Force facilities; Information Analysis Centers (IACs); other federal government organizations; DoD contractors; and regional service facilities for registered DTIC users in Los Angeles, California, Washington, D.C., and Boston, Massachusetts.

DROLS TERMINAL SITES

Army	100
Navy	48
Air Force	40
DoD/DoD Agencies	13
Foreign Governments	1
Information Analysis Centers	10
DTIC In-house	56
Other Government Agencies	22
DoD Contractors	226
TOTAL	516

Originally, access to DROLS was via leased, dedicated lines only, for both classified and unclassified terminals. All terminals were required to be UNIVAC equipment. Several years ago a "dial-up" capability became available for unclassified users that permits the use of a variety of terminals to access DROLS and to pay only for actual "hook-up" time. Figure 6 shows the dramatic increase in DROLS users that the dial-up capability has permitted.

RDT&E ON-LINE SYSTEM GROWTH

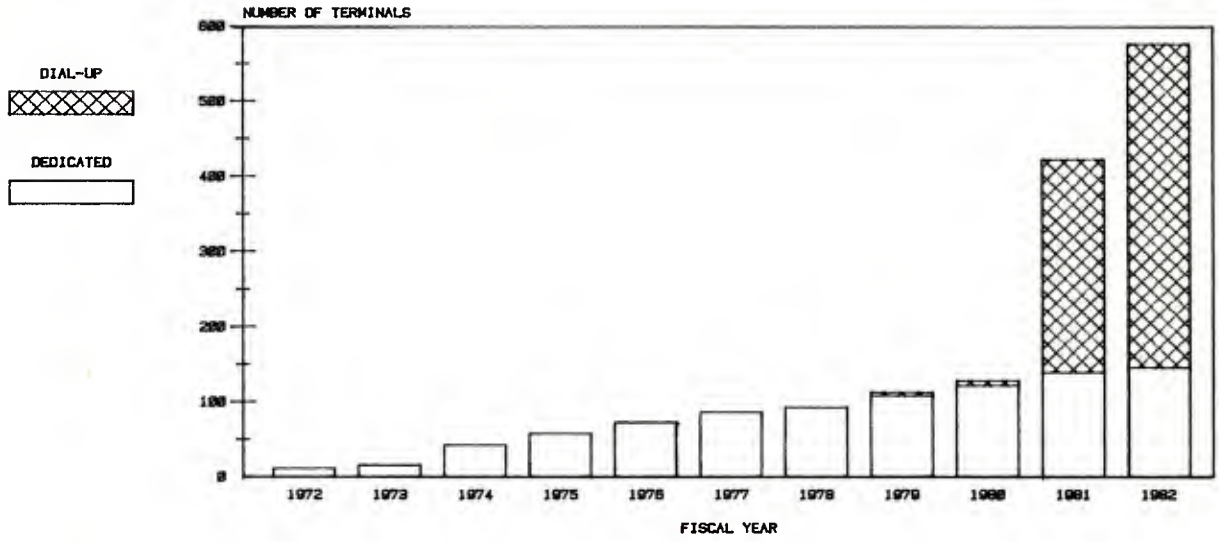


Fig. 6

IV. COMMUNITY OF USERS

Research and development activities within the United States government and their associated contractors, subcontractors, and grantees with current government contracts are eligible to receive most of the information from the DoD data bases located at DTIC. Research and development organizations without current contracts may become eligible for service under various potential contractors programs if sponsored by a military service. Certain collections at DTIC contain proprietary data or information compiled for the specific purpose of DoD management decisions which are made available to Defense components only.[15, 16]

USER COMMUNITY

DoD AND DoD CONTRACTORS

OTHER GOVERNMENT AGENCIES

LIMITED SERVICE TO PUBLIC

About 2950 organizations are now registered for DTIC services. Most are in-house DoD or DoD contractors. Some are from other government agencies and their contractors.

REGISTRATION

Registration for DTIC's services involves the completion of two forms.

REGISTRATION FOR STI SERVICES SAMPLE DATA ELEMENTS

Part I -	Requester Application	Organization Name Address Prime Contract/Grant or Program Number/ Expiration Date Security Classification Required
Part II -	Prime Contractor Approval (If Part I is a Subcontractor)	Organization Name Address Subcontract Number/Expiration Date
Part III -	Certification and Approval	Organization Name Address Name/Title of Approving Official

In addition, contractors complete a facility clearance register.

FACILITY CLEARANCE REGISTER SAMPLE DATA ELEMENTS

Part I - For Contractor	Name of Facility Address to Which Classified Material Will Be Forwarded. Name/Title of Requester
Part II - For Cognizant Security Office	Verification That Facility Listed in Part I Is Cleared To Receive and Store DoD Classified Material Up To and Including (Classification) Name of Cognizant Security Office Address Name/Title/Signature of Certifying Official

REFERENCE/PUBLIC SERVICES

Each year DTIC responds to a large number of letters from individuals from industrial, research, educational, and state and local government organizations asking for information concerning the availability of technical reports to the general public. Searches of the DTIC collections and other sources are performed; the requester is advised if the particular reports are available, and how and from whom copies may be obtained.

When a DoD-sponsored report is not available to the public, DTIC forwards a copy of the requested report with the original request to the military controlling office to determine if the distribution limitation can be waived. If DTIC receives authority for public release, the report is provided to the National Technical Information Service (NTIS), Department of Commerce. (Through a contractual agreement with DTIC, NTIS provides the public copies of DoD R&D reports that are unclassified/unlimited. More than half of DTIC's technical reports become available to the general public via this route.) If selective release to the individual requester is approved, the controlling office will furnish the document unless many requests for the same document are involved. If release is not approved, the military controlling office so notifies the requester. As time permits, DTIC refers requesters to other useful sources as well.

NTIS announces the Defense reports, along with reports generated by R&D activities of other government departments, in its publication, Government Reports Announcements and its Indexes, and offers the reports for public sale.

FOREIGN REQUESTERS

DTIC does not serve foreign requesters.[10] Release may be arranged only through the foreign release organizations of the respective military services. DTIC does, however, provide assistance to requesters through correspondence and telephone contacts with foreign embassies.

When an inquiry is received from a foreign requester (government, industry, research or educational institution, or an individual), DTIC identifies the information or document requested and determines its availability and the source from which it may be obtained. Availability information is sent with the original inquiry to the appropriate embassy.

LEGAL QUESTIONS

In connection with litigation, government attorneys often contact DTIC to request information concerning announcements of specific reports to the general public and disposition of patent ownerships resulting from particular research projects sponsored or cosponsored by DoD. DTIC makes a search and provides applicable report numbers, computer printouts, and catalog cards containing bibliographic data. This service is subject to a charge based on personnel costs.

RELEASE CONTROLS

DoD Directive 5200.20, Distribution Statements on Technical Documents,[10] provides that all technical documents generated by DoD programs and eligible for distribution outside DoD will be reviewed by the controlling DoD office to determine their availability. They are marked either as approved for public release (distribution unlimited) or as limited distribution. In the latter case, requests from the general public and foreign requests must be referred to the controlling DoD office. This has no connection with security classification.

V. SOURCES OF INFORMATION COLLECTED

Primary contributors are individuals and organizations within DoD and under contract to DoD. Other contributors are NATO member countries and certain U.S. Government agencies that have special agreements with DoD.

Defense laboratories and their contractors are required to deposit information (both unclassified and classified, including secret and restricted data) into DTIC's data bases for subsequent retrieval by eligible users.

R&D Planning Summaries (DD Forms 1634) are submitted annually and reflect the current situation on the date of preparation.[7] An R&D Planning Summary must be submitted for any new project included in the project listings supporting each budget submission. Revisions or changes are required only where a change in funding has had a significant impact on the technical content of the project or task area.

Data elements concerning research and technology efforts at the work unit level are reported on DD Forms 1498 (R&T Work Unit Summary) either on magnetic tape, on punched cards, or on the paper forms themselves.[8] Work unit data is submitted to DTIC within 15 working days after the local action which it reflects has occurred within performing organizations.

Legible paper copies of technical reports are required to be forwarded to DTIC on completion of specific phases of all projects. For example, reports may be prepared quarterly, annually, or when all research has been completed, in which case copies are forwarded to DTIC no later than at the time of primary distribution.[6]

DTIC uses source-prepared summaries (DD Forms 1473 - Report Documentation Page) as the basis for its processing, announcing, and cross-referencing to the work unit and program planning data banks.

VI. EFFORTS UNDER WAY TO IMPROVE SERVICES

DoD IAC SUPPORT

As part of its expanded role in DoD's science and technology program, DTIC has been assigned as the program manager for nine DoD contractor-operated Information Analysis Centers (IACs). (There are 10 other DoD-sponsored IACs.) This includes providing necessary support and services related to improved coordination, planning, and integration of DoD-funded IACs and effecting and supporting a comprehensive program to improve IAC visibility, effectiveness, and use of the IACs in support of DoD and federal scientific and technical programs. It also involves developing and providing systems and services to assist or supplement IAC operations or programs to effect and promote resource sharing, joint approaches to common objectives and problems, and information exchange among the IACs, DTIC, and other components of the STIP.

Information Analysis Centers (IACs) are authoritative focal points of expertise in the field of S&T in which a particular center operates. As such, their contributions to DoD and its contractors in solving technological problems and in planning advanced defense systems are substantial.

SAMPLE IAC FIELDS OF SPECIALIZATION

Reliability Analysis
Chemical Propulsion
Infrared Physics
Nondestructive Testing
Tactical Weapons Guidance and Control
Metal Matrix Composites
Metals and Ceramics
Thermophysical and Electronic Properties

An IAC conference organized by DTIC in December of 1981 provided an excellent forum for reviewing and analyzing the IAC program. Management and operations of IACs were explored and recommendations were made to ensure a dynamic, integrated information system.[17]

PRODUCTIVITY TRENDS/DEVELOPMENT EFFORTS

DTIC has always prided itself on maintaining an impressive productivity record. Figure 7 measures productivity in its most basic form, total accomplishments by total resources. Workloads shown are those being measured by DLA's Performance Evaluation Reporting System (PERS), and total obligational authority is measured in constant FY 73 dollars. While DTIC's workloads for the past 9 years have increased by 60 percent, funds available have been reduced by almost 30 percent in real terms.

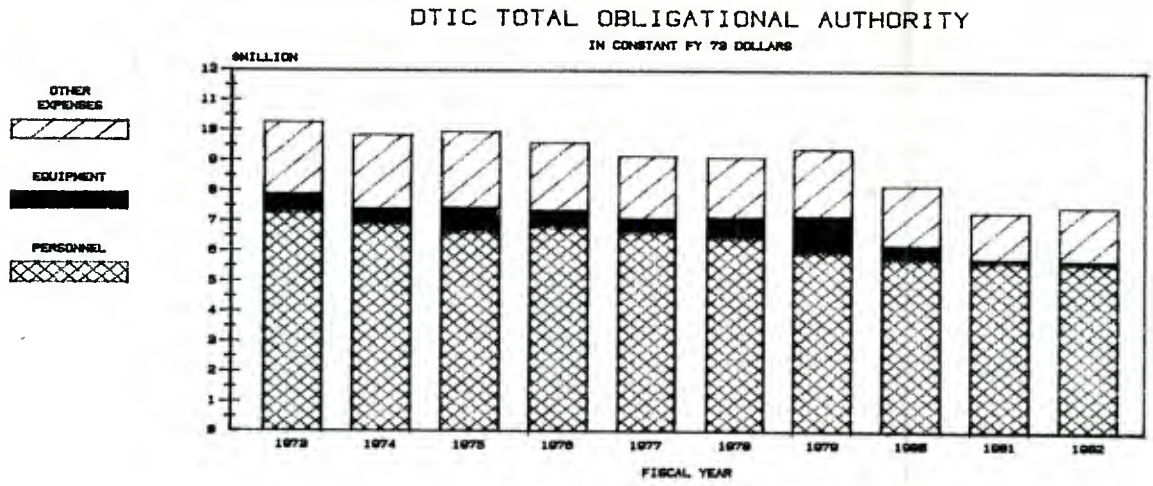


Fig. 7

Future plans call for DTIC to function as a DoD technical information development laboratory and to provide technical and management information support to R&D managers in the office of the Deputy Under Secretary of Defense, Research and Engineering.

MAJOR DEVELOPMENT PROJECTS

- Free Text Experiment
- Experimental DoD R&D Management Support Facility (DTIC ADPE Time Sharing Service)
- Expanded Retrieval Training Program for DROLS
- Data Base of Data Bases
- Multimedia Input Project

Free text searching has been used successfully by others and could provide more comprehensive search results at DTIC. It has been implemented in all three of our management data bases. The concept involves placing single terms or words extracted from the title and abstract portions of the data bases in the inverted file for retrieval purposes. We've recently begun free-text searching for the unclassified title in the TR data base. This is expected to improve the effectiveness and efficiency of the acquisitions, cataloging, and reference functions in DTIC. If the title search capability proves successful, future plans include expanding the free-text capability to include the abstract portion of the record.

We are continually adding data bases to DTIC's ADPE Time Sharing Service (DTSS). This service uses a UNIVAC 1108 computer, standard UNIVAC software, and proprietary software packages including a data management system developed by Battelle-Columbus Laboratories. Users of the service communicate by direct dial-up or by using a time-shared communications network.

DTSS provides a rapid means for DTIC to develop and support new unclassified information systems for DoD. In addition, it permits us to experiment with and develop scientific and technical information systems and services as well as internal support for DTIC operations.

Data bases either established or being developed on DTSS include: a Manpower and Training Research Information System (a data base to track research efforts in manpower and training), a tri-service manufacturing technology data base, the Research Case Assignment and Litigation Locator legal data base, a serials data base for DTIC's internal reference library, and a DoD Conferences and Symposia Data Base.

Given the prominent place DROLS occupies in DTIC's service spectrum, and given the significant increases in its users made possible through the unclassified dial-up capability, efforts are under way to develop supplemental DROLS training. The approach will likely be modular to accommodate both dedicated and dial-up sites, and it will be configured so as to be cost effective and to provide self-instruction training for instructors and data base users in the field.

Presently, DTIC is defining data elements to constitute a single, centralized, comprehensive record of both bibliographic and non-bibliographic scientific and technical data bases sponsored by DoD. This data base of data bases will provide a single-source reference point and will be made available through a paperbound directory and an interactive information storage and retrieval computer system updated annually.

To facilitate DTIC's obtaining R&D information, we have experiments under way that may permit us to be more flexible in the form and format of technical documents we accept. Three input media to be tested are camera-ready document copy, microfiche input, and combination documents of hard copy/microfiche.

SHARED BIBLIOGRAPHIC INPUT NETWORK

Support for the early dissemination of the results of science and technology efforts and the incorporation of this information into DTIC's system is being accomplished through DTIC's operational Shared Bibliographic Input Network (SBIN).

GOALS OF SHARED BIBLIOGRAPHIC INPUT

DoD On-line Catalog

Central Clearinghouse of Availability Information and/or Acquisition of Defense-sponsored Documents

Printouts of Individual Holdings of Libraries/Information Centers

Support for Local Storage of Restricted-Access Material Using the Same System

SBIN permits participants to input bibliographic records directly from their remote terminals at libraries and information centers. DTIC provides the centralized computer capability and shares with the remote sites the input of information to create an on-line Defense catalog and referral service.

VII. EXTERNAL ARRANGEMENTS

As a "closed system" for DoD, DTIC does not have the authority to enter into external arrangements.[18, 19]

One aspect of the DTIC mission, however, involves the primary distribution to designated recipients within the United States of technical reports obtained from the United Kingdom, Canada, and Australia, or from any other countries with whom similar bilateral agreements for routine exchange of R&D reports may be executed in the future.

Reports thus transmitted to DTIC for primary distribution are also processed into our system for subsequent secondary distribution to qualified DTIC users. Prior to making either primary or secondary distribution of classified reports, DTIC ascertains that the recipient's facility clearance is established at the necessary level.

PART B

NASA SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM

HISTORICAL DEVELOPMENT

The National Aeronautics and Space Administration (NASA) was created by an act of the U.S. Congress in 1958 following a national debate which centered on the desirability of concentrating the American efforts in space in one agency. The successful Russian launching of Sputnik, the world's first artificial earth satellite, in October 1957, provided further impetus to this debate.

On October 1, 1958, NASA was established by the National Aeronautics and Space Act of 1958 as the successor to the National Advisory Committee for Aeronautics (NACA), which since 1915 had provided fundamental contributions to the progress of aeronautical science in the United States. Under terms of the Space Act, the property, facilities, and personnel of NACA were absorbed in the establishment of the new National Aeronautics and Space Administration.

In addition to the four national aeronautical facilities and 8,000 employees provided by NACA, NASA absorbed within a year the Jet Propulsion Laboratory and its assets, the Project Vanguard personnel from the U.S. Naval Research Laboratory, and the Development Operations Division of the Army Ballistics Missile Agency, which was headed by the world-renowned rocket engineer, Wernher von Braun. Other important organization centers were later created from the nucleus of transferred elements or by the acts of the U.S. Congress.

ESTABLISHMENT OF THE TECHNICAL INFORMATION PROGRAM

The new NASA organization continued to use the established NACA technical information processing system which had been designed for internal NACA use. This system was composed of a card catalog collection of 1,800,000 cards, three index-announcement publications, and a collection of NACA and other technical reports. The index-announcement publications were the Technical Publications Announcements (TPA) which listed NACA, British and AGARD documents but contained no indexes, an "Accession List" for distribution to the internal NACA family, which included the non-NACA documents that had been acquired and indexed for the NACA system, and finally, the "Index to NACA Technical Publications" which was issued on an annual basis. Catalog cards were prepared from the "Accession List" and distributed to the NACA centers. The Index was arranged according to a NACA classification scheme and contained a personal author index.

For two years NASA continued to use the information system begun by NACA. However, with the rapid expansion of the space program that was occurring at that time, the limitations of the NACA system as a way to handle the expected volume of information in a timely manner soon became apparent. Whereas NACA had done most of its research work in its own laboratories and employed virtually no outside contractors, NASA, while continuing to utilize its own laboratories, anticipated the employment of as many as 400 prime contractors and 10,000 subcontractors. The reports to be produced under these advanced research contracts would severely overload the NACA system.

In May 1960, the first large step to create a comprehensive scientific and technical information program in NASA to accomplish what the Space Act of 1958 required, namely, that NASA "provide for the widest practicable and appropriate dissemination of information concerning its activities and results thereof" was made. An Office of Technical Information and Education Programs was established. Melvin S. Day, Director of technical information at the former Atomic Energy Commission, was hired as Deputy Director of that office. In 1962 Day was named as the Director of the newly organized Office of Scientific and Technical Information. The NASA STI Program developed five operating "principles" which applied to this program then and continue, in updated form, to apply today:

1. Local access for the ultimate consumer;
2. Centralization only when necessary;
3. Timeliness;
4. Cooperation and collaboration with existing information systems;
5. Variety of products and services for a variety of user publics.

1. Under the first principle, local access for the ultimate consumer, the NASA Scientific and Technical Information (STI) Program tries to provide the scientist, the engineer, the laboratory worker, etc., with whatever information products, tools, and services he needs locally to do his job. He should not have to call a Washington or other remote office for help except in unusual cases. Technical reports, literature announcement and abstract journals, microfiche of documents recently acquired, access by local terminals to the NASA data base, and selective document announcement services are examples of local services and tools.

2. Centralization only when necessary, the second principle is a corollary of the first. It emphasizes the least centralization in the information program that is practical, using central processing only as it is demanded for efficiency, economy, or speed. Examples of centralized activities are acquisition, evaluation, duplicate checking, abstracting, cataloging, indexing, and microfilming. Such work is performed at a central location under NASA Headquarters, at the NASA Scientific and Technical Information Facility. NASA field installations and research centers are spared these tasks. One central computer services the information retrieval needs of all NASA installations by permitting local access to the NASA data base via the NASA/RECON system. The hours of computer operation at the NASA Facility are so arranged that they overlap the hour of work at the various NASA Centers located in four different time zones.

3. Timeliness, the third principle, is essential. Since the establishment of the NASA Scientific and Technical Information Facility, there has been a requirement to process and announce all reports obtained within four to six weeks after their receipt. The microfiche of reports and papers announced in the abstract

journals, Scientific and Technical Aerospace Reports (STAR) or International Aerospace Abstracts (IAA) are scheduled for delivery to the NASA Centers one week before the delivery of these journals. Literature searches requested from the NASA Facility are produced overnight and mailed within 48 hours. RECON commands from field-located terminals are answered in two or three seconds. Timeliness gets new information into hands of the people who need it without delay so as to eliminate any undesirable duplication and to incorporate as quickly as possible the thinking and results of others in their own or related fields.

4. The fourth principle, cooperation and collaboration with existing information systems, is of critical importance to the program's cost. NASA works closely with STI programs in other U.S. Government Agencies such as the Defense Technical Information Center of the Department of Defense, the Technical Information Service of the Department of Energy, and the National Technical Information Service of the Department of Commerce. NASA was among the first to provide and receive bibliographic information on magnetic tape to eliminate needless duplication.

NASA also works closely with specialized professional information organizations. Thus grew the division of labor between NASA and the American Institute of Aeronautics and Astronautics (AIAA). Beginning in January 1963, with NASA contract support, AIAA has provided in its International Aerospace Abstracts (IAA) coverage in depth of the world's published literature while the NASA program has concentrated in the Scientific and Technical Aerospace Reports (STAR) on similar coverage of the world's report literature. Both the NASA and AIAA journals utilize the same indexing system. Citations to each journal are available on the main NASA data base. Publication of IAA on alternating semimonthly schedule with STAR and other arrangements have been made. A unique feature of both journals for the early period was the inclusion of indexes in each issue and the timely, i.e., quarterly, cumulations of the indexes. The use of computer was instrumental in producing these timely indexes and later, through its on-line remote searching capability, allowed the quarterly cumulative indexes to become simply annual indexes.

5. The last principle promotes a variety of tools and services to suit a variety of user publics. Plainly no one tool, no one product, no one service can possibly satisfy the information needs of all users who are composed of librarians, information scientists, physical and biological scientists, engineers in a variety of disciplines, managers, and university researchers, all in various kinds of governmental, contractor and subcontractor organizations.

THE NASA SCIENTIFIC AND TECHNICAL INFORMATION FACILITY

While the principle of decentralization is and has been an integral part of the NASA information program, it was also realized that there are numerous functions that can be performed most efficiently and economically in a central location. These functions included the acquisition and processing of the world's aerospace report literature. In 1961 NASA management decided to establish the NASA Scientific and Technical Information Facility (STIF) in the Washington metropolitan area. To operate the Facility, it was also decided to contract with an information-system organization experienced in the abstracting and indexing of scientific documents and utilization of advanced information techniques and machines. The advantage of contracting as opposed to setting up an in-house operation was that it accelerated the process of establishing the NASA Facility by getting the immediate services of specialists, working quarters, and standing equipment and machines and bypassing the delays which would ensue in justifying, recruiting, selecting, hiring, and training a large in-house staff. The burgeoning growth of the American space program in 1960-1961 created an avalanche of technical information which proved impossible to control under the old system adopted from the NACA days but which required an immediate solution. It should be noted that the decision to operate an information facility on a contract basis was a major departure from the then current practices of other U.S. Government agencies.

In December 1961, Documentation, Inc., a Bethesda, Maryland, firm was selected competitively as the first contractor to operate the NASA information facility. The NASA Scientific and Technical Information Facility itself was established in January 1962 and became operational in July 1962 on the premises of the contractor. By 1966 the space occupied by NASA STIF had become inadequate and so larger quarters were secured and leased in College Park, Maryland. Documentation, Inc. (Doc. Inc.) and Leasco Inc. continued as the contractor-operator until 1968 when NASA conducted another competition and selected Informatics, Inc. as its contractor.

In 1975 the NASA STIF was relocated to its present site in Linthicum Heights, Maryland, near the Baltimore-Washington International Airport. Since 1980, the contractor of that facility has been the Planning Research Corporation's Government Information Systems Company, McLean, Virginia. It employs approximately 180 people including professional searchers, technical information specialists, librarians, computer experts, and various machine operators.

While operations at the NASA Scientific and Technical Information Facility are carried out by contractor personnel, policy and close technical guidance are provided by NASA's Scientific and Technical Information Branch (STIB). This Branch has its own specialists responsible for the major functional areas of the NASA STIF, who are in daily contact with the Facility managers to ensure smooth operations, solve emerging problems, and plan for future improvements. STIB's staff currently numbers 24.

OPERATIONAL AUTHORITY

In the National Aeronautics and Space Act of 1958, the U.S. Congress mandated in Section 203 of that Act:

> The Administration, (i.e., NASA) in order to carry out the purpose of this Act, shall --
>
> 1. plan, direct, and conduct aeronautical and space activities;
> 2. arrange for participation by the scientific community in planning scientific measurements

and observations to be made through use of aeronautical and space vehicles, and conduct or arrange for the conduct of such measurements and observations; and

3. provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof.

Thus Section 203 of the Space Act authorized the National Aeronautics and Space Administration in the field of scientific and technical information to establish and operate a NASA-wide program to ensure the fulfillment of information needs of all participants in NASA's research, development and technical programs, and to ensure ready access to NASA-generated scientific knowledge to non-NASA qualified users in the scientific, industrial, and educational communities.

NASA's Scientific and Technical Information Program goals provide for the design and development of an integrated, comprehensive system to ensure that NASA's work and its findings are reported both comprehensively and selectively; that all suitable information is provided to organizations and interests that can properly utilize it; that any of its scientific and technical information can be identified and made available in a meaningful form to specialized endeavors that in any way promote the national aeronautics and space programs; and that NASA programs receive full benefit of related technical information generated by the activities of others.

The program encompasses four principal work areas:

1. publications effort -- designed to provide both basic and supplementary interpretative publication of all information accruing directly from NASA's undertakings;
2. the acquisition and bibliographic control of all information resulting from, or necessary to support, the varied efforts in the aeronautical and space sciences, and the provision of NASA-wide reference services;
3. NASA participation in and support of scientific symposia and technical meetings; and
4. development activities in the field of scientific communication and documentation to promote the first three areas.

INFORMATION SERVICES AND PRODUCTS PROVIDED

Over the course of 20 years, the NASA scientific and technical information program has developed and refined information tools, products, and services which have proven beneficial.

1. STAR

Scientific and Technical Aerospace Reports (STAR) is the hallmark component of the comprehensive National Aeronautics and Space Administration information system covering aeronautics, space and supporting disciplines. STAR is the guide to thousands of current technical reports issued by organizations thoughout the world. Twice a month it publishes abstracts and indexes of current reports acquired by NASA and processed for inclusion in the NASA scientific and technical data base. STAR announces the following types of publications:

- o NASA, NASA contractor, and NASA grantee reports;
- o Reports issued by other U.S. Government agencies, domestic and foreign institutions, universities, and private firms;
- o Translations in report form;
- o NASA-Owned patent and patent applications;
- o Dissertations and theses.

STAR publication began in 1963. Nearly 500,000 citations have been published in STAR to January 1982. New citations are being added at the rate of 24,000 per year. STAR provides five indexes: subject, personal author, corporate source, contract number, and report/accession number. It is issued to NASA Center libraries and to other organizations registered with NASA. Subscriptions to STAR and copies of individual issues and its index are publicly available from the U.S. Government Printing Office.

2. IAA

International Aerospace Abstracts (IAA) is a semimonthly document announcement journal that provides abstracts and indexes of published documents in fields related to aerospace research and technology. NASA supports the preparation of IAA which has been a publication of the American Institute of Aeronautics and Astronautics (AIAA) since 1961. IAA lists journal articles, conference papers, books, and other forms of published literature that have been selected and processed by AIAA for incorporation into the NASA data base. IAA and STAR complement each other in the coverage of aerospace literature. As of January 1982, IAA had published approximately 666,000 citations of the published aerospace literature. At present about 37,000 citations are announced yearly. AIAA regularly scans hundreds of domestic and foreign journals known to be fertile sources of aerospace literature as well as publishers' lists and similar records of new publications. IAA essentially contains the same indexes that are in STAR. IAA and its cumulated index are available by subscription from the AIAA subscription office.

3. LSTAR

Limited Scientific and Technical Aerospace Reports (LSTAR) is a quarterly document announcement journal that provides abstracts and indexes of security-classified and limited-distribution documents acquired by the NASA Scientific and Technical Information Facility. Special authorization is required for access to the classified or limited-distribution documents found in LSTAR. Since 1972, about 4,000 citations have been announced in LSTAR which cites primarily reports of NASA-sponsored research and development. LSTAR includes five indexes: subject, personal author, corporate source, contract number, and report number. LSTAR is published in January, April, July, and October. To be eligible to request security-classified documents announced in LSTAR, requesters must have been certified:

- To require access to security-classified information in the performance of official U.S. Government-sponsored work; and
- To maintain adequate storage facilities for security-classified information and documents.

Citations in LSTAR do not contain classified information.

4. Technical Documents

Technical documents prepared by NASA, NASA contractor employees, and NASA grantees are collected by NASA's Scientific and Technical Information Branch (STIB) for issuance as NASA formal reports. NASA formal reports are assigned by the staff of NASA's Technical Publications Section to one of six series:

- NASA Special Publications which record scientific and technical information from NASA programs, projects, and missions for presentation to readers of diverse technical backgrounds. NASA Special Publications often are concerned with subjects of substantial potential public interest.
- NASA Reference Publications which are compilations of scientific and technical data and information deemed to be of continuing reference value in particular subject areas or disciplines.
- NASA Technical Papers which record the findings of significant work conducted by NASA scientific and technical personnel. Technical Papers are the agency's counterpart to peer-reviewed journal articles and are subject to professional review controlled by the originating NASA office.
- NASA Technical Memorandums which record scientific and technical findings that do not warrant or cannot be given broad dissemination because of security or restricted-readership consideration.
- NASA Contractor Reports which record scientific and technical findings by NASA-sponsored research and development related efforts that are considered desirable for release by NASA.
- NASA Conference Publications which contain compilations of scientific and technical papers, abstracts, or transcripts arising from conferences, symposia, special lecture series, seminars, and other professional meetings that NASA elects to publish.

5. SCAN

Selected Current Aerospace Notices (SCAN) is a semimonthly current awareness publication. It brings to the user's attention those documents, selected from STAR and IAA, that are relevant to the user's particular information interests. SCAN covers the full spectrum of aerospace information, but it subdivides that spectrum into narrower subject groupings than are provided by the category division of STAR and IAA. Approximately 200 separate SCAN topics are available to choose from: each one carefully tailored to fit the needs of specialized aerospace activities. The number and scope of SCAN topics are not fixed; new topics are added as the need arises and some are eliminated or redefined as user demand dictates. Semimonthly SCAN service is available to NASA employees, other U.S. Government agency personnel, contractors, grantees, and affiliated academic personnel.

6. Continuing Bibliographies

NASA publishes continuing bibliographies in certain fields. Each bibliography assembles recent citations on a single aerospace topic of wide interest, selected from STAR or IAA. The bibliographies currently being produced are:

Aeronautical Engineering (NASA SP-7037)
Aerospace Medicine and Biology (NASA SP-7011)
Earth Resources (NASA SP-7041)
Energy (NASA SP-7043)
Management (NASA SP-7500)
NASA Patent Abstracts (NASA SP-7039)

7. Quarterly Listing of AGARD Reports

A listing of AGARD reports announced in STAR is prepared on a quarterly basis. Citations and abstracts in original format are contained in the listing. No indexes are included. The listing was published first in September 1967. This quarterly listing is available to AGARD panel members.

8. AGARD Index of Publications

The AGARD Index of Publications contains abstracts and indexes to AGARD documents published and distributed during the period covered. The first issue of the index covered the period 1952-1970, while subsequent issues have covered three-year periods.

9. NASA RECON

NASA RECON (Remote Console) is a computerized, online, interactive system for information research and retrieval. It enables users at remote locations to communicate directly with the host computer at the NASA Scientific and Technical Information Facility, containing the central scientific and technical information data base. RECON displays bibliographic information in ways that help to define user retrieval needs with maximum precision, guides the user to relevant documents through the use of Boolean logic, and permits simultaneous access for other users throughout the United States.

The RECON data base contains bibliographic information on well over 2,000,000 reports, journal articles, and miscellaneous documents of worldwide origin and of special interest to the aerospace community. The major document series accessible on RECON are:

- Scientific and Technical Aerospace Reports (STAR)
- International Aerospace Abstracts (IAA)
- Limited Scientific and Technical Aerospace Reports (LSTAR)
- Unannounced limited documents

- o NASA Research and Technology Objectives and Plans Summary (RTOPS)
- o NASA Research and Development Contract Search File
- o Computer Program Abstracts (CPA)
- o NASA Tech Briefs
- o NASA Library Collection

The RECON system enables the terminal user to display file indexes, choose desired index terms, combine sets of documents corresponding to these terms, display the resulting record, and print when desired. Response time is about 2 seconds and the system is capable of handling multiple collections of information, each with its own unique vocabulary data elements and descriptions.

10. Literature Search Service

For researchers who do not have access to the NASA data base locally through RECON, the NASA Scientific and Technical Information Facility provides individual literature searches on request to authorized users. In addition to the NASA data base, the STIF specialists provide NASA investigators with searches from a variety of other data bases.

11. Microfiche and Microcopy Service

Microfiche copies of documents announced in STAR are distributed automatically to NASA libraries. This distribution is performed semimonthly and ensures that microfiche of documents in a particular STAR issue is available locally before that STAR issue is published. This is a great help to librarians tasked to fill requests from patrons who spot an interesting report in the STAR issue.

The NASA Scientific and Technical Information Facility provides microfiche for all documents announced in STAR except those that are copyrighted and those that are barred from reproduction by unusual physical characteristics.

Microfiched documents are identified in NASA announcement journals and continuing bibliographies by a pound sign (#) following the accession number (for example N82-12345#).

The NASA Scientific and Technical Information Facility produces microfiche for about 18,000 documents a year. Approximately half of this number represents original or "master" sheets prepared by NASA STIF from hard copy and the other half represents prepared ("converted") sheets by NASA STIF from other microfiche. From these masters and converted fiche, NASA makes more than two million copies a year for automatic distribution to about 235 user organizations.

All microfiche produced by NASA STIF conform to the National Microfilm Association's Industrial Standard. They measure 105 mm by 148 mm and contain up to 98 pages at a reduction of 24X.

NASA microfiche is delivered to a central point, such as the library or information center, in each organization that has registered with the NASA Scientific and Technical Information Facility to receive document delivery service. The distribution of microfiche takes three forms:

- o Automatic distribution of all microfiche to organizations with broad information needs;
- o Selective distribution to organizations that have specified STAR categories as adequate to their needs; and
- o On-request distribution to NASA, foreign exchanges, and NASA Industrial Application Centers.

12. Translation Service

The NASA Scientific and Technical Information Program provides translation services to NASA scientists, engineers, administrators, and its other personnel on a request basis. Foreign language reports, books, journal articles, and official correspondence are translated regularly. Capability to translate from more than 30 foreign languages into English is available.

Before beginning the translation of a technical document, to prevent duplication, a search of the existing records of NASA and other U.S. Government agencies as well as published translation indexes is made. NASA RECON is a valuable tool in this regard. Telephonic and written inquiries are used with other U.S. Government agencies. The number of positive "hits" found during this searching is low: less than 2% of all requests are satisfied by translations completed or in process. However, these searches pay for themselves over a period of time.

NASA contracts with small business firms which actually produce the translations. These firms maintain on-site translation capability for the following languages: Russian, German, French, Italian, Spanish, Japanese, Dutch, Czech, and Portuguese. They also have affiliation with free lances in more than 20 languages.

All NASA field centers order their translation services from the same firms. This unique provision was covered in the contract signed with each firm. Completed translation work is returned to the field center with a copy going to the manager of translation service at NASA Headquarters who provides quality control to the products and is the focus for any unique translation need, problem, or solution.

NASA translations are distributed in the NASA Technical Memorandum series and announced in STAR.

13. Journal Holdings for NASA Libraries

Comprehensive listings of all scientific and technical periodicals available in the NASA Headquarters Library and the libraries of all the field centers are combined in the Journal Holdings of NASA Libraries which is updated annually. A subject index classifies the alphabetically listed periodicals in 216 broad subject categories with extreme cross referencing. The Journal Holdings tells what periodicals are available, which libraries have them, and which issues of each title are held. Cross references indicate superseded

and superseding relationships between titles. Copies of Journal Holdings are available for reference at each NASA Center library.

14. Research and Technology Objectives and Plans Summary (RTOPS)

RTOPS is an annual guide to NASA-sponsored research in progress. It is a summary, with indexes, of all Research and Technology Objectives and Plans submitted by NASA Centers to NASA Headquarters for management review. A separate RTOP is prepared at the beginning of each fiscal year for every research project funded by NASA, which can be inhouse, through contract, grant, or interagency agreement. RTOP Summary is an annual publication which may be purchased from the National Technical Information Service. Citations for individual RTOPS are included in the computerized NASA data base.

15. NASA Research and Development Contract Search (R&DCS) File

The NASA R&DCS File contains information about NASA R&D contracts, grants, and orders issued since January 1, 1971. References to over 15,000 contracts are included in the file. The NASA R&DCS File is available to NASA personnel.

NASA USER COMMUNITY

One of the principles of the NASA information program has been that of local user services. The products and services produced at the central NASA Scientific and Technical Information Facility are distributed widely and mainly to local user points, such as libraries, information centers, or designated individuals acting as gatekeepers who, in turn, service the information needs of a large local population. Thus, the number of addresses receiving NASA products and services does not begin to reflect the actual number of users.

As of January 1982, within the NASA family of centers there were 432 addresses of local user points. A total of 194 firms, institutes, and universities were registered as NASA contractors. NASA products and services were provided to 229 addresses among government agencies and to 52 government contractors. There were 1,634 other domestic organizations, principally universities and public libraries, and individuals receiving one NASA product or another. Among those classed as foreign users, there were 366 organizations that had signed tripartite agreements, 225 organizations classed as bilateral exchange partners, one as a NASA contractor, and 78 foreign organizations which were not exchange partners but to whom NASA products were supplied, principally STAR and STAR Index. The total of all addresses which include organizations and individuals was 3,477 in January 1982.

SOURCES OF INFORMATION

The current sources of the information received into the NASA scientific and technical information system are shown in Table 1.

TABLE 1
SOURCES OF NASA ACCESSIONS (1981)

Source	Accessions	Percentage
NASA (including contractors)	15,459	24%
Dept. of Defense (including contractors)	12,062	18%
DOE, FAA, etc.	13,085	20%
Private Industry	161	-
Research/Academic Institutions	2,840	4%
Foreign Sources	5,374	8%
Library of Congress	16,452	25%
TOTAL	65,433	

This table indicates that NASA and its contractors and grantees in 1981 were responsible for providing 15,459 accessions or approximately 24%. The Department of Defense was responsible for 18%, and other U.S. Government departments and agencies responsible for 20%. The number of accessions emanating from private industrial sources, that is, sources not supported by government funds was 161. Research and academic institutions were the source for 2,840 accessioned documents, or 4%. Foreign sources were responsible for 5,374 accessions or 8%. Lastly, the Library of Congress provided 16,452 accessions or 25%. The book accessions taken from the Library of Congress MARC II are available to NASA librarians on NASA NALNET, the NASA Library Network.

TABLE 2
SOURCES OF INFORMATION ACCESSIONED IN
INTERNATIONAL AEROSPACE ABSTRACTS (1981)

	Journal Articles	Meeting Papers	Mono-graphs	Conference Volumes	Collected Works	Total No. of Accessions
Australia	88			144		232
Austria	143					143
Belgium	16		2	1		19
Bulgaria	78					78
Canada	89		1	93		183
China Communist	169				28	197
China Nationalist	12					12
Czechoslovakia	125		1			126
Denmark	4					4
England	4,541	10	32	471	112	5,166
Estonia	3					3
Finland	3					3
France	667	47	38	64	1	817
East Germany	192					192
West Germany	1,394	126	38	295	8	1,861
Hungary	37		1			38
India	200		1	69		270
International Association for Hydraulic Research			1			1
International Association for Hydrological Sciences					1	1
International Astronautical Federation		430				430
International Atomic Energy Agency					1	1
International Council of the Aeronautical Sciences		1		11		12
International Society for Photogrammetry				279		279
International Solar Energy Society				2		2
International Union of Physiological Sciences		1				1
Ireland			1			1
Israel	29				22	51
Italy	224			15		239
Japan	596		1	287		884
Latvia	162		2			164
Mexico	7					7
Netherlands	1,380	4	19	307	62	1,772
NATO		4				4
Norway	4		1			5
Poland	254			40	2	296
Rumania	45					45
Saudi Arabia	2					2
South Africa	6					6
Spain	7					7
Sweden	59					59
Switzerland	275		2	79	2	358
USSR	4,526		287	38	555	5,406
Yugoslavia	1					1
Sub-total	15,338	623	428	2,195	794	19,378
United States	9,539	1,978	112	5,042	316	16,987
Sub-total	24,877	2,601	540	7,237	1,110	36,365
U.S. Translations of Soviet Periodicals	3,570					3,570
British Translations of Soviet Periodicals	47					47
TOTAL	28,494	2,601	540	7,237	1,110	39,982

Table 2 shows the country of origin of accessions received and processed in 1981 by the American Institute of Aeronautics and Astronautics into its abstract journal, International Aerospace Abstracts. Of the 39,982 accessions, approximately 48% or 19,378 accessions were from foreign sources and the balance from United States sources. However, if the U.S. and British produced translations were transferred to the foreign column then 58% of the accessions would be considered as foreign.

EFFORTS UNDERWAY TO IMPROVE SERVICES

Use of the RECON online retrieval system is being expanded to meet the requirements of a variety of organizations involved in NASA programs. This extension is made possible by a computer upgrade to the IBM 4341 class of processor units combined with new technology direct-access storage devices, specifically, the IBM 3380 disks. The new storage devices make it possible to greatly increase online storage of not only traditional bibliographic, project, and contract information, but also to store online new types of data. An example is descriptions of numerical data bases located at NASA Centers or contractor sites. Treating information of this class is a new direction for the NASA scientific and technical information program whereby modern methods of communications serve to permit switching of inquiries and electronic delivery of information. Indeed, new communications, photocomposition, and data-entry methods are expected to allow word-processing data-entry devices located at NASA Field Centers to tie directly by communications linkages into the central bibliographic data base. Thus, another cycle of decentralization would occur where optimum use is made of centralized capabilities. Following this evolutionary change, the same or similar techniques are expected to extend present data bases to include full-text data. Thus, full text can be expected to complement the numerical data bases previously noted.

Indexing of information for retrieval has traditionally been a specialty of information centers such as the NASA Scientific and Technical Information Facility. Cooperative effort based upon work done at the Defense Technical Information Center will lead to machine-aided indexing and more consistent application of the controlled vocabularies developed to meet NASA requirements. Following establishment of this partially automated approach to indexing, NASA planners expect to utilize similar online dictionaries and cross reference mechanisms to assist in the information retrieval process involving natural language and full text.

Another area of service improvement is NASA's continual modification of the scope of its bibliographic data bases to reflect new aerospace directions. For example, increased interest in NASA programs in large space structures results in new continuing bibliographies, and new approaches toward existing subject areas such as life sciences result in increased coverage. NASA has arranged with the Library of Congress and the American Institute of Aeronautics and Astronautics for expansion of the coverage of the field of life sciences in IAA. In 1982 the Library analysts will provide a total of 1,200 additional accessions in aerospace medicine, behavioral sciences, man/system technology and life support, and planetary biology. It is expected that most of these accessions will come from the Russian published literature.

THE NASA FOREIGN EXCHANGE PROGRAM

In general, NASA makes its scientific and technical information available only to foreign government organizations, research establishments, institutes of higher learning, and international organizations which have formally agreed to furnish NASA with documents pertinent to aeronautics or space and their related earth applications. Categories of documentation provided vary in each case, and a formal arrangement is tailored to the type, quality, and utility of the documents NASA receives in return.

NASA seeks from its formal exchange partners research reports, monographs, doctoral theses, bibliographies, and information other than formally published literature, which relate to the NASA mission and objectives. Contributions are continuously monitored and each formal arrangement is subjected to an annual evaluation. If the quality and quantity of documents contributed are much less than anticipated, NASA may modify the terms of the arrangement or terminate it completely.

A potential exchange candidate must provide specimens of its information products, a quantitative estimate of anticipated yearly contributions and specific indications as to which material NASA may copy or photograph on microfiche and make available to the U.S. public. The terms of a formal exchange arrangement are negotiated for NASA by its Scientific and Technical Information Branch in coordination with the NASA International Affairs Division.

Contributions from exchange partners are screened, evaluated, indexed in the NASA information system, and when appropriate, are announced and abstracted in STAR and IAA.

Foreign contributions accessioned in the information system are made available by NASA directly to its family of users and through the National Technical Information Service to the aerospace community and the public.

The primary products offered by NASA in its exchange are STAR and STAR Indexes. Exchange partners which supply both substantial and significant contributions are offered additional services such as automatic distribution of NASA formal series reports in selected subject categories and secondary request privileges.

NASA has formal bilateral exchange arrangements with 225 organizations in 49 countries. Some 2,574 documents were received from foreign exchange sources during 1981.

In addition, a special arrangement with the Information Retrieval Service of the European Space Agency (ESA) provides not only for reciprocal document exchange, but also for the exchange of special services. Under this arrangement, NASA provides its formal series reports and microfiche of other reports announced

in STAR and the computerized tape index to these items for ESA's on-line use of the NASA files in Europe. In turn, European users which have completed a Tripartite Agreement with NASA and ESA have on-line access to the NASA files maintained by ESA in Frascati, Italy, in exchange for at least one, timely, in-scope technical report for each hour of on-line access time. As of May 1982, there were 366 Tripartite participants in 17 countries. ESA also supplies complete document processing, including microfiche masters, for the NASA information system on acquisitions from its Member States and selected NASA exchanges and translation services on materials selected by NASA.

OVERALL CONCLUSIONS

From NASA's inception in 1958, there has existed a broad commonality of interests between the NASA aerospace technical information program and the defense technical information program. A very close degree of coordination and collaboration has been maintained in the acquisition of scientific and technological reports affecting the national space and defense efforts, which have as their primary goal the advancement of scientific frontiers and the prevention of unnecessary duplication of research and development.

The Defense Technical Information Center's services and products are available to and used extensively by NASA installations, contractors, and grantees. Department of Defense installations, contractors, and grantees can and do receive similar services from the NASA Scientific and Technical Information Facility. Examples of reciprocal services are the dissemination of the abstract journals, preparation of literature searches, notification of on-going research, etc.

All possible steps have been taken to permit the utilization by either agency of the machine-readable products of the other; with machine output from one being the direct machine input to the other, duplicative processing of common materials is minimized. Further, each contributes to the other's development of basic cataloging rules, standardization of microfiche products, assistance in thesaurus development, exchange of computer terminals to utilize each other's data base in literature searches and in other ways.

However compatible the two information systems are, there are differences which must remain. The defense information network is huge and supports a vast array of military and civilian installations. Classified information is a vital part of the total information data base maintained by DTIC. NASA STIF has small holdings of classified information; nearly all its information can be read in the open literature or purchased from the National Technical Information Service. The classes of information held by DTIC exhibit much broader ranges of interests than the NASA data base. NASA's association with the American Institute of Aeronautics and Astronautics is unique, too. Foreign accessions in the NASA data base are much greater than in the DTIC data base. Thus, each information system has contributions to make to the other and has done so for a long time and will continue to do so in the future.

ACKNOWLEDGEMENTS

Ms. Linda L. McGinnis -- for research and editorial efforts that made DTIC's portion of this paper "happen."

Ms. Mildred T. Drum -- whose assistance helps me make it through every day, for expertly typing and formatting Part A in the midst of a multitude of diverse, pressing duties.

I wish to acknowledge with much gratitude the assistance given in the preparation of this paper by Myron C. Nagurney, Van A. Wente, and Charles W. Hargrave, NASA Headquarters staff, and for patient manuscript typing by Ms. Susan B. Critchley, NASA Headquarters staff.

PART A REFERENCES

1. John L. McClellan, Chairman, Committee on Government Operations; Hubert H. Humphrey, Chairman, Subcommittee on Reorganization and International Organizations; United States Senate; "Coordination of Information on Current Scientific Research and Development Supported by the United States Government -- Administrative and Scientific Problems and Opportunities of Central Registration of Research Projects in Science and Engineering"; 1961; Report No. 263; pgs. 2 and v.

2. Dr. Alvin M. Weinburg, Chairman, President's Science Advisory Committee Panel on Science Information; "Science, Government, and Information -- The Responsibilities of the Technical Community and the Government in the Transfer of Information"; 1963.

3. System Development Corporation; "Recommendations for National Document Handling Systems in Science and Technology -- Appendix A - A Background Study - Vol. 1"; 1965; PB 168 267.

4. John L. McClellan, Chairman, Committee on Government Operations; Hubert H. Humphrey, Chairman, Subcommittee on Reorganization and International Organizations; United States Senate; "Summary of Activities Toward Interagency Coordination"; 1965, Report No. 369; pgs. 11-12.

5. King Research, Inc.; Value of the Energy Data Base, DoE/OR/11232-1, DE 82014250, March 31, 1982.

6. DoD Directive 5100.36, "Defense Scientific and Technical Information Program," October 2, 1981.

7. DoD Instruction 7720.16, "Research and Development Planning Summary (DD Form 1634) for Research and Development Program Planning Review," December 10, 1968.

8. DoD Instruction 7720.13, "Research and Technology Work Unit Information System," April 16, 1968.

9. Military Standard (MIL-STD) 847-A, Format Requirements for Scientific and Technical Reports Prepared by or for the Department of Defense, January 31, 1973.

10. Department of Defense Directive 5200.20, Distribution Statements on Technical Documents, September 24, 1970.

11. DoD Instruction 5100.66, "Establishment of Policy for, and Administration of, Independent Research and Development Programs (IR&D)," January 7, 1975.

12. DoD Directive 5400.7, "DoD Freedom of Information Act Program," March 24, 1980.

13. COSATI Subject Category List (DoD-Modified), October 1965, AD 624 000.

14. Guidelines for Descriptive Cataloging of Reports, March 1978, Committee on Information Hang-ups Working Group on Updating COSATI, PB-277 951, AD-A050 900.

15. DoD Directive 5122.5, "Assistant Secretary of Defense (Public Affairs)," July 10, 1961.

16. DoD Directive 5230.9, "Clearance of Department of Defense Public Information," December 24, 1966.

17. DoD Information Analysis Center Conference, December 8-10, 1981, Naval Surface Weapons Center, White Oak, Maryland.

18. DoD Directive 5230.11, "Disclosure of Classified Military Information to Foreign Governments and International Organizations," March 2, 1979.

19. DoD Instruction 5230.17, "Procedures and Standards for Disclosure of Military Information to Foreign Activities," August 17, 1979.

PART B REFERENCES

1. Melvin S. Day, The NASA Scientific and Technical Information Program of the National Aeronautics and Space Administration, Washington, D.C. NASA TM-X-84165, 1963.

2. Melvin S. Day, The Scientific and Technical Information Program of the National Aeronautics and Space Administration, J. Chemical Documentation, 3, pp. 226-228, 1963.

3. Hubert E. Sauter, A Review of NASA's New Scientific and Technical Information Program, In: Proceedings, Symposium on Materials Information Retrieval, Wright-Patterson AFB, Ohio, Report ASD-TDR-63-445, pp. 87-92, 1963.

4. Robert L. Rosholt, An Administrative History of NASA, 1958-1963, NASA SP-4101, National Aeronautics and Space Administration, Washington, D.C., 1966.

5. Van A. Wente, NASA/RECON and User Interface Considerations, In: Interactive Bibliographic Search: The User/Computer Interface, D. E. Walker, Editor, Montvale, N.J., AFIPS Press, 1971, pp. 95-104.

6. NASA Guidelines on Report Literature, National Aeronautics and Space Administration, Washington, D.C., NASA SP-7200, 1978.

7. George P. Chandler, Jr., The Role of NASA for Aerospace Information, In: International Access to Aerospace Information, AGARD Conference Proceedings, AGARD CP-279, pp. 31-34, 1980. (N80-32282)

SCIENTIFIC AND TECHNICAL REPORT SERVICES

by

Tom Norton
Chief Librarian, Ministry of Agriculture, Fisheries and Food,
3 Whitehall Place, London SW1A 2HH and formerly
Deputy Chief Librarian, Royal Aircraft Establishment, Farnborough, Hampshire, UK

SUMMARY

This paper addresses a number of topics associated with scientific and technical report services available from defence/aerospace and other technical information centres. Attention is drawn to AGARD publications which are prime sources of information on these topics: the "Manual of Documentation Practices Applicable to Defence Aerospace Scientific and Technical Information" (AG 235) and proceedings of previous conferences.

Topics which are covered briefly are: abstract journals, announcement services and Selective Dissemination of Information (SDI), microfiche, bibliographies and literature searches. Document supply is treated in greater detail and covers the advantages and disadvantages of online document ordering and electronic document supply projects such as ARTEMIS, ADONIS and APOLLO. Finally, a project to control European grey literature - System for Information on Grey Literature in Europe (SIGLE) - is described.

INTRODUCTION

1 My brief this afternoon is to cover a number of topics associated with scientific and technical report services available from defence/aerospace and other technical information centres.

2 However, I must tell you at the outset that I intend to limit my treatment of the subject for the following reasons:

(a) there is not the time to deal with the whole subject adequately. It would only be possible to cover a single country on a superficial level; to give an international perspective would be clearly impossible;

(b) a good deal of information on the subject has already been published by AGARD and should be easily available from the various National Distribution Centres which are listed on the back cover of all AGARD publications.

3 The principal published source is the 5 volume *Manual of Documentation Practices Applicable to Defence-Aerospace Scientific and Technical Information*[1] (hereafter referred to as the *Manual*). Publication of the *Manual* was completed in February this year with the appearance of the index to the whole work. The *Manual* has been prepared as a practical "how to do it" guide for those wishing to start a new technical centre or perhaps to improve an existing one. The availability of the *Manual* should mean that there is less need for comprehensive treatment of basic topics at meetings such as this. It can be assumed that the audience will be familiar with the contents of the *Manual* and the speaker is therefore free to concentrate on recent developments, if there are any, in particular subject areas. Let me give you two examples of basic topics: "Dissemination Practices" by Fred Dyer (Volume III, Section 8) deals with the policies and practices of 20 information centres of varying sizes with regard to initial distribution of material, specific requests for material, guidelines on sensitive aspects and conditions of release. This latter topic is treated comprehensively in "Security Storage and Control" by Michael Sims (Volume IV, Section 10).

4 The second source of information on the subject of my paper is the published proceedings of previous Technical Information Panel (TIP) conferences. Two examples from the 1979 Athens meeting which are relevant are: George Chandler's "The Role of NASA for Aerospace Information"[2] and Peter Auger's "Kinds of Access to Unclassified Literature"[3]. As an aside, I came across many other excellent papers in the conference proceedings published over the years. They are a valuable resource which should not be lost. Perhaps they could be rescued from undeserved oblivion and repackaged and published in an anthology.

5 As I suggested just now, it is not necessary for me to give a detailed treatment of basic topics. Where necessary I shall make reference to the *Manual* or conference papers. I will limit my remarks to those aspects of the subject which might provide useful fodder for chewing over during our discussion period.

6 The topics I want to cover are:

(a) abstract journals

(b) announcement services and Selective Dissemination of Information (SDI)

(c) microfiche

(d) bibliographies and literature searches.

I shall deal briefly with these and in much greater details with:

(e) document supply.

Document supply is the area in which there has recently been a number of developments and there are some interesting experiments in hand to improve the situation.

ABSTRACT JOURNALS

7 Dyer's survey of dissemination practices which I referred to previously mentions some abstracting services for sensitive material provided by various information centres. It is, of course, entirely reasonable that where sensitive material is concerned, centres will tend to produce their individual abstracting bulletins. With regard to unclassified literature, there is far greater scope for relying on external services. The defence/aerospace field is comprehensively covered by *Scientific and Technical Aerospace Reports (STAR)* and *International Aerospace Abstracts (IAA)*. Both publications are sufficiently well known to need no further description here; the papers by Chandler and Auger which I mentioned earlier have the necessary details.

8 There is an obvious point which is nevertheless worth making here. If you were to analyse the percentage of time spent on the various activities in your library or information centre, you might be surprised (and dismayed) to discover how much of it was spent on input activities - on processing material into store - and how little on output activities - on disseminating and promoting the use of such material. The aim should be to try and redress this balance. With the availability of *STAR* and *IAA* there should be less need for effort to be devoted to elaborate indexing of unclassified material.

ANNOUNCEMENT SERVICES AND SELECTIVE DISSEMINATION OF INFORMATION (SDI)

9 If we now narrow our focus from the broad field to a more selective area, Dyer's survey reveals various standard profile services such as NASA's *Selected Current Aerospace Notices (SCAN)*, the National Technical Information Service's *Tech Notes* and *Abstract Newsletter*. The UK Defence Research Information Centre (DRIC) produces a series of standard profiles which are made up of items arranged in broad subject categories derived from the main data base. The purpose of these kinds of publications is to make users aware of new material coming into the various systems and although their coverage is broad, the user needs only to scan a relatively small part of the information spectrum in order to keep up with developments.

10 This type of service is aimed at groups rather than individuals for whom a Selective Dissemination of Information (SDI) or current awareness service can be tailored to suit individual interests. Dyer again has noted the various kinds of SDI services provided by the information centres he surveyed. SDI combined with document delivery in the form of microfiche saves waiting time and costs for postage and packing. NTIS provides such a service with Selected Research in Microfiche (SRIM) in which an automatic distribution takes place every two weeks of microfiche reports in subject areas selected by the requester.

11 Full details of how to operate an SDI service are given in Volume II, Section 6 of the *Manual*.

MICROFICHE

12 As the volume of report literature grew, there was a need for a method of producing documents which offered the advantages of:

(a) convenient storage
(b) low cost reproduction
(c) ease of transmission

and a solution was found in various kinds of microform. At first 16 and 35mm microfilm, later microcards and latterly microfiche, which is now the prime medium for reports in microform.

13 Most information centres will have substantial collections of reports in microfiche form. These collections can be built up either by direct purchase or exchange from the issuing organisation or by drawing on national collections. For example, the UK British Library Lending Division (BLLD) has a reports collection which is mostly in microform of about 2 million items. The collection includes all unrestricted reports issued by the principal US agencies - NTIS, NASA, the US Department of Energy and the RAND Corporation. A detailed check list of the major reports series received at the BLLD has been produced[4]. The services of BLLD are available outside the UK and some ½ million overseas requests are dealt with each year.

14 The main advantages of microfiche which I mentioned earlier - convenient storage, low cost reproduction and ease of transmission - are advantages which are mainly to the benefit of the organisation which produces or issues microfiche. There is still a fair amount of user resistance to microfiche. I suppose the basic objection is having to use a piece of equipment to carry out the every day act of reading. In addition, many users prefer to read documents away from the work place - on a train or at home; there is

really no incentive to buy a microfiche reader for home use since there is so little published solely on microfiche which could be described as other than work-related.

15 Another disadvantage of microfiche for the user is the difficulty of referring easily from one section to another and back again. However, I believe that this problem could be partly overcome if the producers of microfiche were willing to structure information so as to take advantage of the special characteristics of microfiche. There is not time to develop the topic in detail so I have noted an excellent article which does this[5]. Let me briefly mention some possibilities with regard to report literature. With a hard copy document, the Contents List is often printed at the front and diagrams and tables at the back. It would be wasteful to repeat this information throughout the report and in any case the user can easily refer backwards and forwards in the document. However, if the document is reproduced on microfiche without modification, then the user cannot easily do this. With a microfiche, space is free and repetition is not wasteful but is structurally desirable in order to improve the useability of information. Why not repeat the contents list frequently throughout the report and repeat diagrams and tables wherever they are referred to? I realise that this would involve microfiche producers in extra work and effort but they should be willing to do it if they are serious about increasing the use of microfiche. I suspect that a good proportion of the many microfiche which information centres produce and distribute to users are unread.

16 The technical and managerial aspects of microfiche production are comprehensively dealt with in Volume III, Section 9 of the *Manual*.

BIBLIOGRAPHIES AND LITERATURE SEARCHES

17 The preparation of bibliographies has been greatly speeded up and simplified by the availability of bibliographic information in machine-readable form. Tedious note taking, typing and photocopying which are characteristic of manual searching are eliminated and retrieved references can be arranged in different ways and compiled in a form which is useful to the requester.

18 Apart from bibliographies compiled by information centres for particular purposes, there are a number of continuing bibliographies derived from the NASA data base which illustrate its value as a source for bibliographies. Examples are

Aeronautical Engineering	(NASA SP-7037)
Earth Resources	(NASA SP-7041)
Management	(NASA SP-7500).

19 The availability of external computerised data bases has greatly extended the capacity of information centres for carrying out comprehensive literature searches. According to the Aslib directory of *Online Bibliographic Databases* there are some 70 million bibliographic references searchable via computer and over 85% of these are in the natural sciences and technology[6].

DOCUMENT SUPPLY

20 These 70 million bibliographic references recommend reading to the user to satisfy his need for information. Locating suitable references is merely the start of a process leading to acquiring and using the information. The cited items have to be located, requested and delivered.

21 It is desirable that some items should be immediately available so that the requester does not go away empty handed; most information centres should be able to satisfy a proportion of such document requests from their own stocks. There are various possibilities for obtaining the remaining items. Several host services have introduced an online ordering facility which enables requests to be placed for documents at the same time as the references are retrieved from the system. For example, items retrieved on the British Library's BLAISE system can be automatically requested from the BLLD collections by registered users. Other host systems such as Lockheed/DIALOG and the European Space Agency (ESA)/Information Retrieval Service (IRS) also offer the facility for specific data bases.

22 The main advantages of online document ordering are claimed to be convenience and speed for the following reasons:

(a) it is easy to locate a document supplier; an important consideration where national document collections are not highly developed;

(b) bibliographic checking is eliminated since the data are taken from the data base;

(c) writing out of paper order forms is eliminated since the full bibliographic description of documents is automatically sent to the order file; delays and mistakes caused in retranscribing the data are therefore eliminated.

23 However, in spite of these advantages, a recent study carried out by the German Society for Information and Documentation in cooperation with the Technische Informationsbibliothek in Hanover, found that there was very low usage of online document ordering[7]. The reasons for this low usage represent some of the disadvantages:

(a) high cost of the service;

(b) search results were often checked for relevance from a print-out. Results were only checked for relevance online when the requester was present *and* the number of relevant items was very small;

(c) it was not considered worth the trouble and expense to log on just to order a small number of items from a print-out;

(d) document procurement was normally carried out by library staff without a terminal and who were often not familiar with online searching;

(e) some suppliers required deposit accounts and this was a deterrent for occasional users.

24 Online ordering systems may reduce the time needed to place the order but they do not shorten the delivery time, so other methods of document delivery are presently being investigated and I want to mention some of them.

25 One such system proposed is ARTEMIS (*A*utomatic *R*etrieval of *T*ext from *E*urope's *M*ultinational *I*nformation *S*ervice). The basis of the system is that a document is converted to machine-readable form and stored in a data base; from there it can be retrieved in response to a request and sent overnight via a telecommunications network to the requester's unattended terminal. A study carried out on behalf of the Commission of the European Communities (CEC) indicated that it was technically and economically feasible to create a European-wide system capable of delivering full text overnight at a cost which could be compared to existing charges made by interlending systems[8]. There would seem to be two obstacles to such a system:

(a) the present high telecommunications costs;

(b) copyright problems. No satisfactory system of dealing with the copyright problem has yet been designed which is acceptable to both information providers and users.

26 As an aside, it might be worth mentioning another document delivery project which is being originated by publishers of scientific and technical journals. A consortium of British, Dutch, German and American publishers are investigating a system for setting up a store of journal texts on video discs. Document supply centres such as the BLLD would have direct access to this store and the aim of the project is to provide a high quality, rapid delivery source of documents free of copyright problems - the participating publisher would be paid a usage fee every time one of his articles was requested - and at a cost similar to current cost levels. The project is expected to be operational early in 1984. The name of the project is ADONIS and there does not seem to be spelled-out form. You may recall that in Greek mythology Adonis was a young man who was killed by a wild boar; he was believed to spend part of the year in the underworld and part on earth, thus symbolizing the vegetative cycle. Let us hope that project ADONIS does not vegetate. You may also recall that ARTEMIS was the goddess of the hunt and the moon and she was the twin sister of Apollo.

27 And that is as good a link as I can think of to bring me to project APOLLO which does have a spelled-out form and stands for *A*rticle *P*rocurement with *O*n *L*ine *L*ocal *O*rdering. The project is a cooperative one between the CEC and the ESA and aims to investigate the technical feasibility of converting documents into digital form and transmitting them via satellite. Users will search the ESA data bases in the usual manner and the files will contain an index pointing to the location of a full text document file from which articles can be ordered for high-speed transmission via a satellite link to the user's terminal. The document file will be located at Darmstadt and will contain only a limited range of documents during the test phase. I have not heard anything new about this project in the last few months. Some of you will be visiting the ESA at Frascati on Friday. Perhaps there will be news of recent developments. Apollo, you will remember, was the god of light, poetry, music, healing and prophecy.

28 I have been wondering about the use of the names of mythological figures to describe projects for electronic document delivery. Perhaps the names symbolise the striving after worthy, Olympian ideals or then again perhaps they are meant to suggest the quantum jump between the technically possible and the financially advisable. We obviously need a project with a name which will include both hope and despair. As we are in Rome I should like to suggest Janus, the Roman god of doorways, passages and bridges, who is depicted in art with two heads facing opposite ways.

29 Document delivery, whether by electronic or other methods, means that the documents are available for supply. I want to deal finally with a project for ensuring that documents do become available for supply. Reports, translations and conference proceedings which are not issued through the usual commercial publication channels and which can, therefore, be difficult to get are known as "non-conventional" or "grey literature". Other types of publications which can fall into this category are theses and official documents issued in limited numbers (for example, UK Government department publications not issued through Her Majesty's Stationery Office). There is an increasing trend for producers of scientific and technical literature to publish in the form of grey literature. The main reasons are that this type of publication is easier, faster and cheaper; it allows the originators to supervise the delivery and to keep in close contact with the

interested users. These advantages for producers are offset by the problems which potential users have in detecting, identifying and acquiring such literature.

30 Since 1 January 1981 major information centres from six EEC countries have been operating the System for Information on Grey Literature in Europe (SIGLE) for an experimental 2 year period. The aims of the project are:

(a) to improve the detection, identification and collection of grey literature items in each EEC country;

(b) to perform a document delivery service for each item recorded by the system;

(c) to set up a European grey literature bibliographical data base which could be available through the EURONET/DIANE network and to publish a grey literature index.

31 The BLLD is responsible for input from the British Isles and which is announced in *British Reports, Translations and Theses (BRTT).* SIGLE should therefore be a valuable complement to existing EURONET/DIANE services because it will fill a gap which has hitherto been a weak point in existing data bases: the detection and making available of non-conventional literature[9].

32 And that I think is a suitable note on which to end. My aim has been twofold:

(a) to draw attention to AGARD publications which contain useful information on our subject;

(b) to highlight aspects of the subject which are recent developments and could form the basis of some discussion.

REFERENCES

1. S.C. Schuler, (editor). *Manual of Documentation Practices Applicable to Defence-Aerospace Scientific and Technical Information.* Published in 5 volumes. AGARDograph No.235, 1978-1982

Volume I: (AGARD-AG-235-Vol I)	1 - Acquisition and sources 2 - Descriptive Cataloguing 3 - Abstracting and subject analysis
Volume II: (AGARD-AG-235-Vol II)	4 - Data recording and storage 5 - Mechanization systems and operations 6 - Announcement services and publications
Volume III: (AGARD-AG-235-Vol III)	7 - Information retrieval 8 - Dissemination practices 9 - Microform systems and reprography
Volume IV: (AGARD-AG-235-Vol IV)	10 - Security storage and control 11 - Organisation and management 12 - Networks and external sources of information
Volume V: (AGARD-AG-235-Vol V)	Index

2 G.P. Chandler. "The role of NASA for Aerospace Information" (in AGARD Conference Proceedings No.279: *International Access to Aerospace Information.* AGARD-CP-279, 1980, pages 3-1 to 3-4)

3 C.P. Auger. "Kinds of access to unclassified literature" (in AGARD Conference Proceedings No.279: *International Access to Aerospace Information.* AGARD-CP-279, 1980, pages 7-1 to 7-4)

4 J.P. Chillag. *Report Literature at the British Library Lending Division.* BLLD Translation M27828. English translation of a paper given in German at the Biannual Conference of the Deutsche Arbeitsgemeinschaft für Spezialbibliotheken (ASpB), Kassel, 6-9 March 1979 by J.P. Chillag

5 D.J. Greenwold. "Principles and Paradoxes of Micrographic Information Systems" (in *Proceedings of the 24th NMA Conference and Exposition.* Anaheim: National Micrographics Association, 1975, pages 59-69)

6 J.L. Hall and M.J. Brown. *Online Bibliographic Databases: an International Directory.* 2nd edition, London: Aslib, 1981

7 Gisela I. Roth. "Online document ordering systems of online vendors". *Online Review,* Vol 6, No.3, June 1982, pages 243-251

8 Commission of the European Communities. *ARTEMIS: a system for document digitalisation and teletransmission.* Report by Arthur D. Little, 1980

9 J.P. Chillag. "SIGLE (System for Information on Grey Literature in Europe)". *Interlending Review,* Vol 9, No.2, April 1981, pages 66-7

FURTHER READING

The following items on report literature are recommended.

10 C.P. Auger. *Use of Reports Literature*. London: Butterworth, 1975, ISBN 0 408 70666 X (Chapter 7 deals with aerospace reports)

11 C.P. Auger. "Reports, Patents, Standards and Other Special Material" (in *Handbook of Special Librarianship and Information Work*, 5th edition, London: Aslib, 1982, ISBN 0 85142 161 X pages 102-127)

12 A.H. Holloway and others. *Information Work with Unpublished Reports*. London: André Deutsch, 1976, ISBN 0233 96824 5.

Copyright
©
Controller HMSO London
1982

INTERNATIONAL INFORMATION EXCHANGE

J.E. van Dijk, J.H.M. Heijnen*, P.J.C. Rosenbrand, H.F. de Vries
Netherlands Bibliographical and Documentary Committee (COBIDOC),
Amsterdam, the Netherlands.

1. Introduction

The title of this contribution is "International Information Exchange". The concept information is a comprehensive one. So first of all we have to define which information or what kind of information will be discussed. We restrict ourselves to bibliographical databases in the field of the physical sciences and technology and to the publications which are the source of these bibliographical databases, i.e. books, journal articles, reports and patents. For some databases, e.g. the International Nuclear Information System (INIS), other types of publications can be includes as well, like drawings, films, phonorecords, magnetic tapes and so on[1]. The latter category will not be taken into consideration. We will mainly pay our attention to publications which are not commercially available and to report literature in particular. The importance and use of patent literature had been extensively discussed during an AGARD meeting in October 1980[2].

The importance and size of report literature will be touched on in section 2. We will do so by presenting some examples. Some cases of international cooperation in establishing bibliographical databases and the disclosure of report literature will be outlined in section 3. Some common features of the databases are dealt with in section 4. In sections 5 and 6 a model for international cooperation will be discussed in relation to the necessity of making arrangements at a gouvernmental level to bring this model into practice. Concluding remarks are given in section 7.

* paper to be presented by second author.

2. Size of report literature

Exact figures on the size of report literature are not available. Part of the publicly available reports is referred to in bibliographical databases. To get an impression of the size of the publicly available report literature in the field of physics and technology which is referred to in a bibliographical database, the contents of a number of these databases is examined in table 1. A subdivision is given according to books, journal articles, reports and patents. From these quantitative figures it is clear that report literature is of utmost importance. Besides it is much more difficult to track down reports - many of them only circulate in the important "informal circuit" - than it is for the commercially available journal articles and books, which can be obtained much easier. In case the databases could achieve complete coverage of books, journal articles, reports and patents the contribution of reports, and probably patents, no doubt would even be more substantial. Furthermore the trend to publish the results of scientific and technical research in report form is increasing[3]. The main reason being that publishing a report often is easier, faster and even cheaper than publishing a journal article.
Thus a better detection of report literature and the growing trend to publish the results of research in report form will lead to an increasing contribution of report literature in bibliographical databases.

Table 1

Contents of some bibliographical databases in the field of the physical sciences and technology*

database	subject	annual growth (number of ref.)	categories			
			books	journal articles	reports	others (patents)
INIS	Nuclear research and technology	76.000	10%	56%	30%	4%
EDB	Energy	136.000	12%	48%	36%	4%
INSPEC	Physics, Electrical Engineering and Electronics, Computers and Control	150.000		85%	13%	2%
NTIS**	Science and Technology	70.000		16%	84%	
NASA	Aeronautics and Astronautics incl. Related Fields	70.000	10%	40%	45%	5%

INIS - International Nuclear Information System (International Atomic Energy Agengy)
EDB - Energy information Database (U.S. Department of Energy)
INSPEC - Information Services for the Physics and Engineering Communities
NTIS - National Technical Information Service (U.S. Department of Commerce)
NASA - National Aeronautics and Space Administration

* see 4)

** main source: reports

3. Examples of international cooperation

The INIS database probably gives the most reliable indication of the number of reports which is published in a particular subject field. The INIS database has been set up starting from responsibility sharing principles on a decentralized basis with the International Atomic Energy Agency (IAEA) in Vienna as the coordinating organisation. In 1981 64 IAEA member states and 13 international organisations took part in the INIS project. Every member state and every international organisation taking part in this project has assumed the responsibility for submitting all relevant articles to the system which are published within its territory or under its responsibility. In nearly all member states an INIS centre has been assigned which takes care of the acquisition of the relevant material and of the inclusion of this material in the database. The IAEA integrates the contribution of the member states in 24 bi-monthly updates a year. This decentralized set up of INIS results in a better coverage than can be achieved in conventional centralized systems, like INSPEC. In particular reports can be better tracked down and easier be obtained in the country of origin than from abroad. Obviously a database on a decentralized basis also has disadvantages compared to a centralised database. In the latter case the uniformity of the database will probably be much better. However as far as the coverage is concerned a decentralized set-up performs better. One copy of each report which is included in the INIS database is despatched by the responsible INIS centre to the IAEA in Vienna. All reports received by the IAEA are put on microfiches. A copy of these microfiches is made available to the national INIS clearinghouses. In this way every member state can dispose of a microfiche copy of each report which has been included in the database, no matter by which INIS centre. Thus INIS points the way to a very extensive report collection in the field of nuclear research and technology.
The United States Department of Energy uses the INIS database as a source for the Energy Information Database (EDB). About 35% of the EDB consists of INIS input. The role of the Department of Energy with regard tot the EDB can be compared with the role of the IAEA with regard to INIS. Information exchange agreements have been concluded between the Department of Energy and a number of other countries or have been initiated. What has been said previously on INIS, e.g. on the coverage of report literature, also applies to the EDB. The EDB gives access to a wide collection of report literature in the energy field. Microfiches of reports which have been included in the database are available.

For NASA as well steps have been taken to improve the acquisition and disclosure of report literature by assigning a NASA national centre in a number of countries cooperating in the European Space Agency (ESA). These centres collect all reports in the field of aeronautics and astronautics, which are subsequently sent - via ESA - to NASA.

4. Some characteristics of reports contained in bibliographical databases

A characteristic of reports referred to in bibliographical databases is the considerable delay between the date of publication and the date of inclusion in the database. The figures which are available for INIS are given in table 2.
Corresponding figures for other databases are not at our disposal, but we presume that they will not differ significantly from those presented for INIS. The average delay, i.e. the average time it takes before a report is included in the INIS database after its publication, amounts to nine months for reports with a report number and over two years for reports without a number.
The delay for books also is considerable. For patents no figures are available.
The main causes of delay - in the Netherlands - are 3-fold. First of all it takes about 2-3 month to include a report in the database after it has become available to the INIS center. Secondly the date on which a report becomes available rarely coincides with the date of publication as it is stated in the report (often the date on which an author finishes his manuscript). A third cause of delay is an irregular dispatch of reports to the INIS center. The first cause of delay i.e. the time it takes to index and abstract an article, put it on magnetic tape and so on, is not the most important one. Improvements are hardly possible and only have marginal effects.
The second cause is more important. Obviously the database producer cannot affect this kind of delay, though he often is blamed for it by the users of the database. The irregular dispatch of reports by some institutes to the INIS center is probably due to the fact that the group of INIS users only is a small subgroup (10-20%) of the large group of institutes publishing reports which are relevant for INIS. In this way for a great deal of institutes no reason exists for making their reports available at the shortest possible notice.

What has been said here on INIS and on the Netherlands' situation might also be more or less applicable to other databases and to other countries.
In the examples discussed sofar (INIS, EDB, NASA) only non-classified report literature is selected for inclusion in the databases. The reports are, either as hardcopy or as a microfiche, available from the database producers or from a national clearinghouse, usually a library specialised in (part of) the field covered by the database. An exception can be made for reports issued by organisations wishing to forward their reports to a selected group of interested persons or organisations themselves. This can be realised by means of a so-called availability note, in which relevant details such as the address of the issuing organisation, are given. From experience we know that this is notfrequently done and, if it is done, that security considerations are not a dominating factor.
Nevertheless for reports along the diffuse border line between the 'open' literature and the classified literature this method might be worthwhile to use more frequently than it is the case now.
In practice every organisation itself, if applicable in consultation with a mandatory party, determines the status to be assigned to every single report produced by that organisation. Every organisation maintains its own standards. AGARD and other NATO groups ofcourse are no exception to this rule. From reactions of database users however it turns out that the standards applied to a database in many cases may differ considerably from the standards maintained by the own organisation. Sometimes

a user expects from a database to supply him with (a type of) information he is not prepared to supply himself, which may result in a sincerely(!) disappointed customer. A regular reconsideration of own standards might be advisable.

Generally speaking it can be concluded that it is a difficult job to achieve complete coverage on a certain subject area within reasonable time limits. Classified report literature is not yet of great importance to databases, at least to the databases discussed here.

TABLE 2

Average delay in INIS input-preparation in 1981

Country	Journal articles		Books		Reports (I)		Reports (R)		Total	
	number of articles	av. delay (months)	number of books	av. delay (months)	number of reports	av. delay (months)	number of reports	av. delay (months)	number of publications	av. delay (months)
United States	9.528	5.0	1.260	18.0	-	-	9.695	7.0	20.932	6.0
Netherlands	6.699	5.0	1.675	6.0	143	8.0	18	5.0	8.571	5.0
Soviet Union	5.199	9.0	553	?	853	?	1.207	?	7.812	9.0
United Kingdom	4.928	4.0	931	71.0	266	64.0	311	8.0	6.764	8.0
F.R. Germany	3.290	6.0	568	10.0	658	18.0	962	8.0	5.634	8.0
Total	39.696	7.0	7.618	15.0	4.743	26.0	16.709	9.0	70.788	8.0

Average delay in INIS input preparation in 1981. The delay is the time it takes before an article is included in the INIS database after the date of publication. Chapters in books and reports which have been treated separately in the process of input preparation are considered as separate books or reports. This occurs e.g. in case a book or report consists of contributions of various authors. INIS distinguishes reports with a report number (type R) and reports without a report number (type I). Statistics are given for five main input centres and for all member states and international organisations together.

5. NTIS

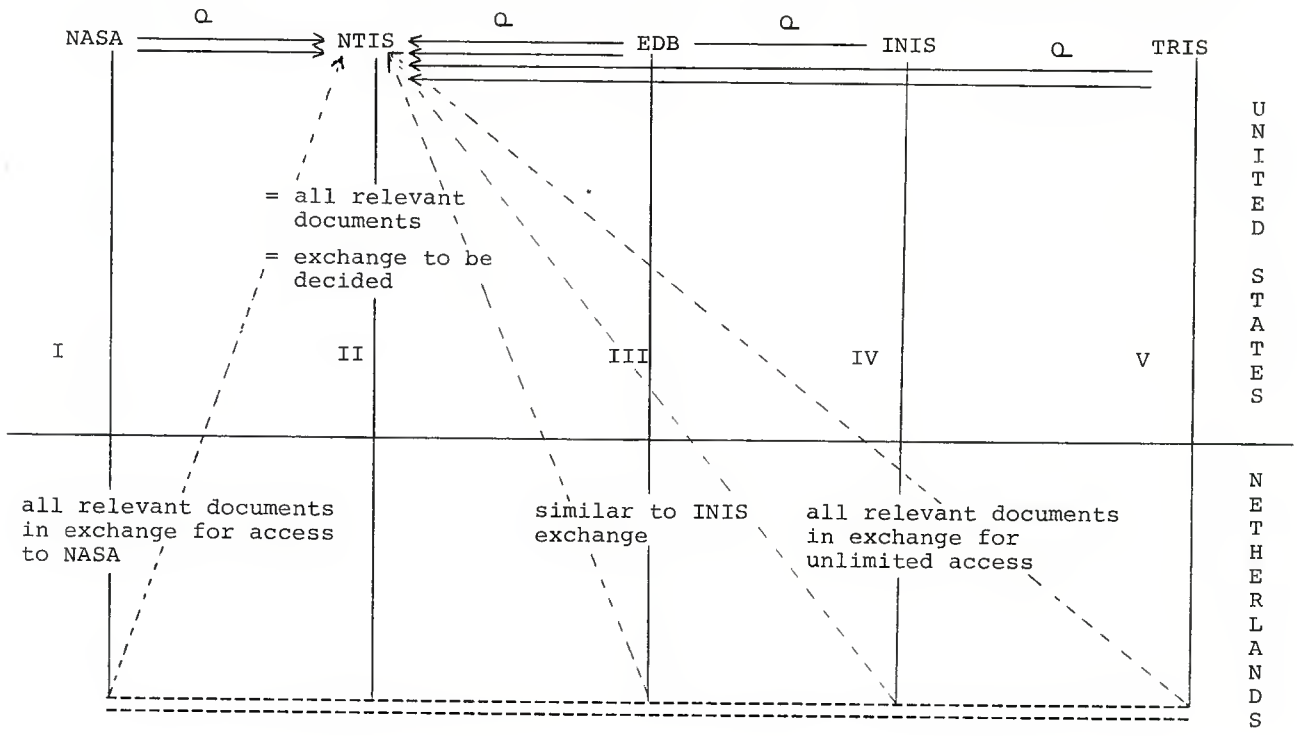
In table 1 five databases are mentioned. One of these databases, i.e. NTIS, sofar has been undiscussed. The National Technical Information Service (NTIS) of the US Department of Commerce was founded in 1960 to collect reports emanating from research subsidized by the American government. Since then, as a result of the technological developments, the responsibilities of NTIS have strongly increased. However collecting reports has remained one of NTIS' major activities. NTIS does not only cover technological research, but also fundamental scientific research and the social sciences. For convenience the sources of the reports which are included in the NTIS database can be divided into four groups, i.e. the Department of Energy (DOE), NASA, the Department of Defense and, as a fourth group, all other US government institutes. Reversely reports which have been obtained for NTIS are passed on to DOE and NASA, for inclusion in the EDB or NASA datbase respectively. As a consequence of the relations between INIS (part of EDB, section 3), EDB, NASA and NTIS the next step would be to extend the international exchange of report literature in the field of science and technology through NTIS in addition to the arrangements which have been set up for INIS, EDB NASA and other databases. As far as the Netherlands are concerned some preparatory actions have been initiated. In figure 1 a schematic survey is given of the existing and possible future relations between the various databases. The Transportation Research Information Service (TRIS) of the Department of Transportation and its International Road Research Documentation (IRRD) file have also been explicitly mentioned here.
While working out this scheme a number of problems still has to be solved. In the Netherlands the working group NTIS is engaged in this topic. A coordinated approach for the acquisition of reports for INIS, EDB, NASA and NTIS has highest priority. Coordination can take place in a centralized or in a de-centralized set up. In the first case one central organisation would be responsible for collecting reports for all databases. In the latter case the existing channels (institutes) specialized on various subject areas would be mobilized. Probably the second option, which is in accordance with the information infrastructure built up in the Netherlands, will be chosen.
Not only in the Netherlands but also in the United States arrangements, which sometimes may already exist for quite a long time,may have to be tuned. The example of NASA database users who are obliged to submit one report to NASA in return to one hour on-line access to the database is well known. However reports which are included in the NASA database via INIS and EDB do not entitle an organisation to online access to the NASA database.
Although the set-up of figure 1 has not yet been worked out in all details, it may be expected that it may serve as an adequate basis for exchanging reports.

6. Cooperation at governmental level

In the examples of international cooperation concerning the acquisition and disclosure of report literature in the field of the physical sciences and technology which have been discussed previously,

FIG. 1

POSSIBLE SET-UP OF INPUT HARMONIZATION WITHIN THE FRAMEWORK OF CONCLUDING AN INFORMATION EXCHANGE AGREEMENT BETWEEN THE STATE OF THE NETHERLANDS AND NTIS



I NASA input flow, selection of Dutch input by the Netherlands, indexing by ESA, final selection by NASA, tapes sent to NTIS, flow of documents out of scope (after final selection) sent by NASA to NTIS;

II NTIS input flow (all documents which are not in scope for NASA, INIS or EDB), selection by the Netherlands, indexing by NTIS;

III EDB input flow, selection and indexing of Dutch input by the Netherlands, tapes sent to NTIS by DOE;

IV INIS input flow, selection and indexing of Dutch input by the Netherlands, tapes sent to NTIS by DOE; it is expected that NL INIS tapes in the future will be merged with EDB tapes;

V IRRD input flow, selection and indexing of Dutch input by the Netherlands, tapes sent to TRIS and merged, TRIS tapes sent to NTIS;

------- list of documents sent by the responsible organizations in the Netherlands to the various database producers other than NTIS (acquisition lists);

========internal coordination among the different responsible organizations in the Netherlands of the various documents which might be in scope for the various systems;

magnetic tape.

an agreement has been or is supposed to be concluded at a governmental level. The governments of the participating countries have assumed or will assume the responsibility for the preparation of input for the various databases and, if required, for the delivery of the articles which are the source of these databases. Of course, many arrangements at an institute level do already exist, but arrangements at a governmental level are necessary because the flow of publications in many subject areas can no longer be regulated by the exchange of reports etc. between individual institutes. An example: INIS distinguishes reports with a report number and repors without a report number (table 2). In the first category 2000 report series are included, published by about 1000 different organisations[5]. From experience with Dutch INIS input we know that the number of organisations regularly or incidentally producing reports to which no report number is assigned, exceeds the number of organisations producing reports containing a report number, by far. This information flow cannot be handled by individual institutes (unless the reports of the major part of the institutes

are considered to be irrelevant by definition and only the reports of a few selected institutes are considered to be worthwhile; this policy - though maybe not common practice - is not a rarity). So governments have to play an active role here. In section 4 some remarks were given with regard to the delay in including report literature in bibliographical databases and the acquisition problems. The delay and the large number of organisations involved do point to a decentralized set-up of the input preparation in which per country one organisation, assigned by the government, accepts the responsibility for the input preparation for a particular database. The responsibilities for some databases might be combined. Furthermore it is important that the various modes of input preparation for various databases which have developed independently, be coordinated to avoid wasteful duplication of effort. In the framework of setting up a model for NTIS an attempt to coordinate the input flow in different databases has been undertaken. It may be expected that the number of 'quid-pro-quo' arrangements in which governments of participating countries commit themselves in preparing input in a database, will further increase. Any new commitments should only be fullfilled in addition to existing arrangements and should not interfere with them. Finally the necessity of an extension of existing arrangements should be proved.

At European level developments are taking place which also lead to the collection and disclosure of report literature. Stimulated by the Commission of the European Communities, the Centre d'Etudes Nucléaires (France), the Fachinformationszentrum Energie Physik Mathematik GmbH (F.R. of Germany), the British Library Lending Division (U.K.), Laborelec (Belgium) and the RISØ library (Denmark) have started to set up an information system for grey literature (in particular reports). It is the intention to attract partners for this System for Information on Grey Literature in Europe (SIGLE) in other European countries as well. In this way SIGLE should develop as the European counterpart of NTIS. The SIGLE project still is in the initial stage and not yet operational. A disadvantage is that existing arrangements for INIS, NASA etc. have not been taken into account.

7. Concluding remarks

A survey has been given of some developments with regard to the acquisition and exchange of report literature. Existing arrangements, which have developed separately in the past, should be linked up with each other and should also be taken into account in case a new database is implemented. Duplication of input should be avoided the more so while financial resources are declining. Because of decreasing budgets one may even question whether databases which are sponsored by international organisations or by national governments should continue to cover publications which are easily available, such as books and journal articles, in particular in case other (commercial) database producers already cover these publications. In case financial boundary conditions would be a constraint reports (and patents) might have higher priority.

REFERENCES

1. INIS: descriptive cataloguing rules (IAEA - INIS - 1 (Rev.5), IAEA, Vienna, April 1980)

2. AGARD lecture series no.112: Patents - An information resource (AGARD - LS - 112, 1980)

3. Charles P. Auger (ed.).: Use of Reports Literature (Butterworth & Co. (Publishers) Ltd., 1975)

4. Fachinformationszentrum Energie, Physik, Mathematik GmbH: Information Services (september 1980)

5. INIS: authority list for corporate entries and report number prefixes (IAEA - INIS - 6 (Rev. 14), IAEA, Vienna, April 1981).

INFORMATION ANALYSIS CENTRES AND SERVICES

by
G. J. Zissis
Director, Infrared Information and Analysis Center
Environmental Research Institute of Michigan
P. O. Box 8618
Ann Arbor, Michigan 48107
U.S.A.

SUMMARY

Information Analysis Centers (IACs) have been established to act as readily accessible sources of information for specific user communities. IACs serve as active information disseminators within areas of specific technical disciplines or well-defined functional, technological activities. Each Center collects, reviews, analyses, appraises, summarizes, stores, reformats and disseminates technical information related to the disciplinary (e.g., chemical propulsion) or functional (e.g., tactical technology) areas. Some 20 IACs were supported by the U.S. Department of Defense in 1981 and some of these have operated since the 1950's. Many more such centers have existed in the past thirty years, but were phased out as the need for their services was judged to have passed. A central guiding feature of IACs is their establishment and operation within a larger group of scientists who are leaders active in the fields covered by the IAC. The transfer of technology from the researcher to the developer requires a thorough understanding of the technology and its attendent implications, such as the risks and benefits within the developer's environment. IACs must act in a positive and informed manner to disseminate, in a timely fashion, the needed comprehensive information to authorized users. This paper will review the history of the IAC programs, exploring examples of those which are discipline centered and those which focus on a bounded area of functional application of technology. These examples will reveal contributions made by the IACs to the R&D programs, problems encountered, a variety of methodologies tried out by IACs to address these problems, and some lessons learned which can provide insight and guidance to future IAC activities.

INTRODUCTION

What is an Information Analysis Center? In the U.S., the DoD instruction 5100.45 of 28 July 1964[1] used a phrase "...Centers for Analysis of Scientific and Technical Information (hereinafter referred to as "information analysis centers")..." The document goes on to define a Center as follows:

> "Center for Analysis of Scientific and Technical Information. Any functional element is performing as an information analysis center if it collects, reviews, digests, analyzes, appraises, summarizes and provides advisory and other user services concerning the available scientific and technical infomration and data in a well-defined, specialized field. A center exclusively concerned with review or analysis of scientific or engineering data shall be considered an information analysis center. Such centers are distinguished from documentation centers and libraries, whose functions are primarily concerned with the handling of documents rather than the technical information contained in the documents. (Enclosure 1 gives a comprehensive description of the primary mission and characteristics.)"

The "Enclosure 1" referred to above states that "an Information Analysis Center has" as a "primary mission" five characteristics, namely:

1. "Has clearly defined, specialized area of interest"
2. "Gathers information"
3. "Analysis by staff experts"
4. "Evaluates and condenses"
5. "Provides individual user services"

The discussion in the paragraphs with each characteristic makes several interesting points. Some of these are:

> "It is concerned with clearly-defined and specialized subject matter..."; "The input comprises the world's applicable scientific and technical results drawn from...any other sources or media available...(from)...an aggressive acquisition program..."; "In addition to a staff technically trained in the field of specialization and in information processing...use by the center of laboratory personnel working in the area of specialization as consultants."; "...continuous refinement of indexing and retrieval methods."; and "Foremost, the center answers questions ...specific items of evaluated data or information, current summaries on technical trends, comprehensive state-of-the-art analyses, and specialized advisory services."

HISTORICAL BACKGROUND

Obviously, this concept existed long before the issuance of this referenced DoD instruction. While I have not made an indepth study of its roots, some insight is easily obtained from publications of the older U.S. IAC's. As an example, the DoD IAC Chemical Propulsion Information Agency (CPIA) celebrating it's 35th anniversary in 1981, traced it's existence to the origin in the fall of 1946 of the Rocket Propellent Intelligence Agency (R.P.I.A.)[2]. This was organized and operated by The Johns Hopkins University Applied Physics Laboratory for the Bureau of Ordnance, U.S. Department of the Navy. The name changed in May 1948 to the Solid Propellent Information Agency (SPIA) and the, in December 1962, with incorporation of the Liquid Propellant Information Agency (LPIA, established in 1958 at APL), to CPIA. (Dr. R. E. Gibson, Director Emeritus of APL, traced the establishment of RPIA back to 1918!)

Today, CPIA has the responsibility for acquisition, compilation, analysis and dissemination of information pertinent to chemical propulsion. In addition, CPIA provides technical and administrative support to the Joint Army-Navy-NASA-Air Force (JANNAF) Interagency Propulsion Committee. Clearly, these activities have major significance to the aerospace community and especially defense agencies and industries.

Another U.S. DoD IAC has been operating for more than 20 years. Before its creation, the Thermophysical Properties Research Center (TPRC) was established at Purdue University on 1 January 1956 under the late Prof. Yeram S. Touloukian[3]. Twenty-two industries and two U.S. government research agencies supported this center in which the Thermophysical Properties Information Center (TPIAC) was established on 16 October 1960. TPIAC was Air Force-sponsored until 1971 when sponsorship was transferred to the U.S. Defense Logistics Agency (DLA). This DoD IAC, in mid-1973, incorporated the Electronic Properties Information Analysis Center (EPIC) originally established at the Hughes Aircraft Company in 1961. Also, in 1974, TPRC changed its name to the Center for Information and Numerical Data Analysis and Synthesis (CINDAS) and today the Thermophysical and Electronic Properties Information Analysis Center (TEPIAC) is housed within CINDAS at Purdue.

The publications and other contributions from TEPIAC under the leadership of Dr. Touloukian have achieved international recognition[4]. The technical thrust of TEPIAC has been data on thermophysical, electronic, electrical, magnetic and optical properties of materials. It has emphasized evaluation, reduction and analysis of these data, stressing the critical assessment of the quality and value of the data[5]. A significant data base has been brought into existence and maintained.

There are many other U.S. DoD IAC's, each with a unique mission and history. Our own Infrared Information and Analysis (IRIA) Center at the Environmental Research Institute of Michigan (ERIM) was first established at the predecessor of ERIM, The University of Michigan's Willow Run Laboratories, in 1954 by the Office of Naval Research (ONR). Since 1964, IRIA has been a DoD IAC and today, under ONR scientific direction, is sponsored by the Defense Technical Information Center (DTIC), the three services, DARPA, and many industrial contributors from the U.S. aerospace and defense community. Among its products is The Infrared Handbook[6], a replacement for the 1965 book, The Handbook of Military Infrared Technology[7]. IRIA was recently described in a publication[8]of a sister DoD IAC, The Shock and Vibration Information Center (SVIC) operated by the Naval Research Laboratory (NRL) in Washington, DC.

Profiles of approximately twenty DoD IAC's are presented in a publication by DTIC [9]. It references a much larger work, the DTIC Referral Data Bank Directory, which is more comprehensive, including information on DoD and other U.S.-supported information sources[10].

This cursory look at the literature on IACs and a few examples of especially long-lived IACs, fails to examine the substantial documentation relating to Scientific and Technical Information, and mechanisms to deal with this information. I leave that as beyond the scope of this paper. Instead, I would like to use the limited knowledge I have gained by association with several IACs, some no longer in existence, to examine the implications of the fact that there are two, major, viable categories of IACs. These are the technical discipline-oriented and the mission/function-directed IACs.

THE VALUE OF INFORMATION AND IACs

Any categorization or examination of IACs must involve an examination of a fundamental question which stems from the commodity in which they deal -- information. More relevantly, what is the value of information?

A determination of the worth of anything always raises two questions -- the worth of what, to whom? Evaluation, in the cost-benefit sense, of articles for which there exists no market-pricing structure has always received considerable attention. The most immediate statement one can make in our context is that the value of information must be determined by the decisions made, to some extent, on the basis of the information. Thus, given the new or additional information, we must seek to answer the question -- what difference did it make? (As is often the case, one question leads to another -- and this one is clearly a difficult one.) The problems which immediately come to mind include: (1) the ability to adequately trace the flow of information -- where it came from and where it went; (2) the determination of the role played in the making of decisions; and (3) the value of the decision(s) and of other impacts not reflected directly and primarily in the decision-making process or its products. We are aware of instances in which information has been traced to a decision-maker who made use of the information but only to make a decision of trivial social value. Yet the costs of obtaining the infor-

mation were far from trivial. Obviously, one can cite cases of decisions made, perforce, in the absence of critically needed information, with the attendant costs associated with those decisions.

Still there is almost universal acceptance of the concept that information and the widespread open distribution of information is beneficial; that by and large the more one knows the better off he is; that decisions made on the basis of knowledge cannot be worse than those made from a lesser amount of information; and that an informed group will function better (all other things equal) than an uninformed group. Thus, there is an element of faith that information is "valuable". Support for this conclusion may be found in establishment and support of many information analysis and dissemination activities by the U.S. government. As long ago as April 1968, the Committee on Scientific and Technical Information (COSATI) Panel #6 of the Federal Council for Science and Technology published a directory listing 113 selected specialized information analysis centers[11]. The directory was limited to those centers supported in part at least by Federal funds to "acquire, select, store, retrieve, evaluate, analyze and synthesize a body of information and/or data in a clearly defined specialized field or..."[12]. Excluded were conventional scientific or technical libraries and many other types of information services.

Evaluation of such activities as IAC's is an ongoing effort in the federal agencies which must annually justify the operating budgets required. Efforts are made to obtain a collection of instances with quantifiable "savings". Several years ago, DoD centers instigated "user charges" on the assumption that by this means a market pricing-structure could be realized. One evaluation criterion which was suggested is the ratio of costs to income for these IAC's. Obviously, the income realized is related to the perceived value of the IAC's services. However, perceptions of this type can be unrelated to actual informational transfer[13].

Users can find what could be called "confessional" value in exchanges with IAC's. Rather than information and data, the center may disperse psychological "comfort" in response to inquiries and contacts. Thus, the user's judgment of IAC worth reflects the therapeutic value of such exchanges, not the measure sought for a cost-effectiveness analysis.

Other criteria contain other pitfalls and weaknesses. Evaluations on the basis of amount of output can be done, and this "number game" can attempt to equate information exchange with data bits, pounds of printouts, page numbers, or weight of reports. User evaluations can also be output based -- the so-called "sweetheart letters" often results. These may be solicited rather than spontaneous offerings, but their validity is probably not greatly affected in either instance.

The cost-income ratio criterion is one of several which can be considered to be input-based. The value of the IAC is claimed to be related to the income in dollars or number of customers or some similar numeric. A more attractive set of criteria may follow from effectiveness of alternatives. Here one asks: What would you have done without the information (or the IAC)? How much would you have paid (alternative costs)?

Finally, the seemingly reasonable statement can be made that one should apply all the above criteria and be guided by the evaluations obtained by their application. Although this view has the virtue of reasonable compromise, no convincing case has been made that affords some judgment as to relative weight to be given to each methodology. In practice, the value of information has been assessed by attempts to trace benefits of specific instances and to sum these "benefits" until satisfactory totals are achieved. We are left with many unresolved issues under such evaluations derived from economics analysis.

For example, there is the matter of accuracy of economic data. When data mostly "accrue", rather than being the results of difficult and extensive measurements as is usually the case in the physical sciences, there develops little tradition of quality control. Thus, one finds numerical computations and the ensuing decisions made without adequate estimation of how sensitive the results are, even when modest errors are admitted. Further, it should be noted; "As long as the value of presently available data for decision making by governments and private industry is not established, there is little to be gained in providing more of the same (e.g., Norbert Wiener one remarked that economics is 'a one or at most a two digit science')"[14].

An IAC will find or assemble information which may produce benefits or disbenefits depending upon, in part, its utilization. It will offer some information that perhaps was not at all previously available, and will provide other information that was available before, but will do so at lower cost or in a more timely fashion. Yet the value of this information will depend exclusively upon the uses to which it is put. "In the economist's terminology, we are dealing here with a derived demand -- demand for a product wanted not primarily as an end in itself, but as an instrument to be employed for other purposes"[15].

We have noted that it is all too easy to think of information as an end in itself, as something whose virtue requires no investigation. However, this is not necessarily the case, and information-gathering utilizes resources which could otherwise be used for other purposes. This opportunity cost may, in some cases, exceed a program's contribution. In other cases, the information may not be really appropriate for the uses for which it was gathered. In some situations the information provided is excessive, and its very magnitude serves to hinder effective analysis of the issues. This issue has been summarized as follows: "The evaluation of various types of information in their own terms as contributions to knowledge of value in themselves invites...difficulty. One cannot judge where information is appropriate, or necessary, or sufficient, or excessive, except in terms of the uses to which it will be put"[16].

Thus, we return to explicitly examining what differences the information will make. By specifying the concrete decisions and activities which will be affected by the availability of the information, one tries to attribute credible benefits to this information. The value of the information is determined by an explicit comparison of the decision process as it was before (i.e., in the absence of the information) and after the new information becomes available.

TECHNICAL DISCIPLINE-ORIENTED IACs

For our purposes here, it must be sufficient for us to make the assumption that the supporters and users of IACs have been doing a good job of evaluating both the value of the provided information and the IACs which provided it. This evaluation shows in the continuation of the more highly valued IACs and in the discontinuation of those considered less valuable. My personal experience has included several IACs which no longer exist. A look at these and the IACs mentioned at the start of this paper indicate that long-lived IACs are active information collectors, analysts, and disseminators within specific technical disciplines, and that the IACs which have gone out of existence were active in the same way within a mission/functional-defined, system-program area.

For example, in 1959, the (Defense) Advanced Research Projects Agency (ARPA) established at The University of Michigan, the Ballistic Missile Radiation Analysis Center (BAMIRAC)[17]. I was its Director at that time. BAMIRAC was, in essence, the Information Analysis Center for an ARPA long-range, ballistic missile defense research program named Project DEFENDER. By late 1972, BAMIRAC was to all intents and purposes, out of existence. During the more than a dozen years in which it functioned, BAMIRAC:

- collected, analyzed, stored and disseminated data and information on ballistic missile radiation phenomenology
- administered annual meetings of the Anti-Missile Research Advisory Council (AMRAC) and published their proceedings
- produced analytical phenomenological models for the radiation from ballistic missile launch, mid-course and reentry as well as the associated backgrounds
- conducted indepth laboratory research in directly related areas.

Was BAMIRAC a valuable IAC? Why was it "disestablished"? Basically, for programmatic reasons -- Project DEFENDER ended, and DARPA discontinued the majority of its research efforts in ballistic missile defense shortly after. The same pattern is seen in another ARPA-sponsored IAC which was also at The University of Michigan -- the VELA Seismic Information Analysis Center (VESIAC).

The VELA program of ARPA was concerned with underground nuclear test detection. VESIAC began its work to "...collect, store, analyze and disseminate technical information related to underground nuclear test detection"[18] at The University of Michigan's Willow Run Laboratories in December 1960. VESIAC ended by the end of the sixties. Again, we find a strong mission/program identification with an IAC -- when one goes, the other goes.

The Target Signature Analysis Center (TSAC)[19], established in 1964, closed in the fall of 1972. This IAC, sponsored by the USAF Avionics Laboratory, was also at The University of Michigan, and had the mission to "acquire, store, analyze and disseminate data on targets and backgrounds materials of use in improving aerial reconnaissance and homing techniques." Thus, TSAC obtained and maintained a data base of optical and microwave characteristics of targets and backgrounds of specific relevance to the mission of reconnaissance. Data on the reflectances of man-made and natural materials as well as field measurements were obtained from the coordinated Target Signature Measurement Program. In this way, the digital data base continued to grow and remain current for use in evaluations of target-background models and of system performance. Finally, as the Measurement Program ended, the data base at this mission-oriented IAC was transferred to the government for continued use.

One can speculate that all such program/mission-oriented IACs which are directed toward a system function must be cyclic in their existence. Not that the problems are solved, but priorities change. It is not at all unreasonable to expect some forms of IAC to reappear after about five or ten years. Certainly ballistic missile defense and reconnaissance are military important system functions that remain continuing national concerns. However, it has not been possible to provide a steady-state level of activity for IACs in such areas. This remains a major managerial challenge. The defense community has need of sustained information analysis activities in major, mission/function-directed topics.

To a considerable extent the DoD technical discipline-oriented IACs, which cut across missions, provide a response to this need. Long-lived, discipline-oriented IACs can preserve the knowledge gained in the past, holding data in readiness to allow creation of new mission-oriented IACs when the need arises for their services. The defense/aerospace industry community must remain alert to these needs and not hesitate to establish (or re-establish) centers when the need is sufficiently great.

REFERENCES

1. "Centers for Analysis of Scientific and Technical Information", DoD Instruction 5100.45, 28 July 1964 (now undergoing revision).
2. R. E. Gibson, "Personal Reflections on the Origins of the C.P.I.A.", CPIA Bulletin, Vol.7, No.6, October 1981, p.1.
3. TEPIAC/CINDAS, Purdue University, West Lafayette, IN, Thermophysics and Electronics Newsletter, Vol.10, Nos. 3 and 6, 1981.
4. Thermodynamics Research Center, Texas A&M University, TRC Current Data News, Vol.9, No.2, Fall 1981.
5. Op.Cit. Reference 3, No.5.
6. W. L. Wolfe and G. J. Zissis, Editors, The Infrared Handbook, U.S. Government Printing Office, Washington, DC, 1979.
7. W. L. Wolfe, Editor, Handbook of Military Infrared Technology, University of Michigan Willow Run Laboratories, Ann Arbor, MI, 1965.
8. Shock & Vibration Digest, Vol.14, No.2, January 1982.
9. "Information Analysis Centers Profile", Defense Technical Information Center, Arlington, VA, April 1981.
10. "DTIC Referral Data Bank Director", Defense Technical Information Center, Arlington, VA, AD A095 600, February 1981.
11. "Directory of Federally Supported Information Analysis Center", Sponsored by Panel #6, Information Analysis and Data Centers; Committee on Scientific and Technical Information (COSATI), Federal Council for Science and Technology, (68-60032) (PB 177 050), April 1968.
12. Ibid, pg.i.x.
13. W. H. Veazie, Jr. and T. F. Connolly, "The Marketing of Information Analysis Center Products and Services", ERIC/CLIS, American Society for Information Science, Washington, DC, June 1971.
14. G. J. Zissis, K. P. Hess and R. S. Summers, "Design of a Study to Evaluate Benefits and Cost of Data from the First Earth Resources Technology Satellite (ERTS-A)", University of Michigan Willow Run Laboratories, Ann Arbor, MI, Report No. 11215-1-F, July 1972, pg. 7.
15. Ibid, pg. 8.
16. Ibid, pg. 9.
17. Op.Cit. 11, pg. 16.
18. Op.Cit. 11, pg. 160.
19. Op.Cit. 11, pg. 151.

ON LINE INFORMATION: THE ITALIAN SITUATION

MR T.M. LAZZARI
ISTITUO DI STUDI SULLA RICERCA E DOCUMENTAZIONE SCIENTIFICA (ISRDS)
DEL CONSIGLIO NAZIONALE DELLE RICERCHE (CNR)
VIA C. DE LOLLIS, 12
00185 ROME, ITALY

If one wishes to illustrate the Italian on-line information situation, one must outline a scenario which has gone through an extremely rapid and structured evolution in recent years.

Until the mid seventies Italy could not have been considered one of the most responsive countries to the stimuli of scientific information and its dissemination by means of the new electronic technologies. From this point of view, Italy is not very different from the majority of the European countries. In previous years Italy had suffered a noticeable delay in the process of automating information services and of implementing related public facilities. Such delay was due to cultural and political reasons more than to technological deficiencies.

Awareness of the economic importance of scientific-technological information grew slowly. The same can be said for the delay with which Italy had become aware of the impact of scientific and technological research, as a promoter of industrial and economic development. Furthermore, the European industrial and productive structures, dynamically different from the American, did not encourage the start-up of a specialised industry; i. e., they did not favour conditions capable to develop a European market for the newly--born information industry, conceived mainly for the production of data bases.

The inability to consider information as a consumer's good, capable of fostering a real market, caused until 1975 on-line information to be developed on one hand with the slow pace typical of the re-organization of the national public information structures or of the participation in projects for the implementation of international documentation systems; and on the other, as a result of isolated initiatives, limited to specific sectors (aerospatial-juridical).

To this we must add the unhappy situation of physical structures for telecommunications and for data transmissions at the international level. From this point of view, Europe was very much behind. The only available public networks were those for the normal telephone traffic, administered by the competent public agencies. The only possible way out for anyone wanting to set up an on-line information service was to install his own telecommunication network, as ESA did, and as at the national level will do the electronic documentation Center of the Italian Supreme Court. This option entailed high costs.

In this connection we must also point out that the evolution of the European on--line information market was closely dependent to the expansion of US services. Tymnet and Telenet, to mention the most important networks, had set up numerous European access points, channeling towards the US market the European users. As a matter of fact, it was much easier for a US host computer to sell its information services in Europe, than it was for a European service to start its commercial activity creating its own network.

We msut also note that the absence of adequate national telecommunication services did not indeed encourage the sensitivity of potential Italian users. And in particular we are referring to the numerous small and medium size industries, especially in the South, traditionally cut out from the Italian economy, which did not take any action in order to use the transfer of scientific and technological information to promote industrial and technological development.

The situation is even more disappointing for the access to scientific information by specialized service facilities, such as national and university libraries.

A solid humanistic tradition influences in a conservative manner the national library system, while the issues of scientific documentation and of information dissemination are very much neglected and are entrusted to the iniziatives of the individual or to the industrial sector, also because there are no adequate training facilities in this area.

University libraries and especially those of individual Institutes suffer of the structural and organizational imbalances of the University system as well as of questionable managerial practices.

Until the middle seventies there is in fact no Italian on-line information industry. The already mentioned absence of a national network for data transmission and the lack of interest by the potential users, do not encourage possible business undertakings.

In spite of these negative conditions, some important initiatives are started in order to satisfy the information requirements of European users, including the Italian.

First of all, in the most advanced countries such as England, France, Germany and Sweden documentation centers existed and were capable to satisfy the requirements of scientific usage. Other, mostly non-profit organizations, had organized information services, using the batch access system, while others automated the resulting files.

We should like here to mention some examples: CNRS, INSPEC, EXCERPTA MEDICA, Derwent Publications, etc.

Furthermore, the British Library Lending Division and the Library of the Swedish Nordisnka Institute operated two information and documentation services for the medical sector, based on batch interrogation (inquiry) of Medlars, the data base produced by the US National Library of Medicine.

These informatic technology based initiatives for the treatment, management and retrieval of information, contribute noticeably to sensitize scientific research people on the rising issues of automated information.

For Italian users of information they also provide the opportunity to come to grips with the new technologies.

Some international initiatives have also contributed in this direction.

More specifically, in the early seventies the International Atomic Energy Agency started the project for the realization of the International Nuclear Information System (INIS), in order to collect and disseminate information concerning the various aspects of the peaceful utilization of nuclear science and technology. In every country which participates in the system there exists a INIS liaison officer, i.e. a corresponding national center, responsible for the preparation of the national input and of the dissemination of INIS output. For Italy there is CNEN - National Committee for Nuclear Energy.

In 1975 the Food and Agriculture Organization (FAO) implemented Agris (Agricultural Information System), a world information system for agricultural science and technology. Newdays, about 70 countries belong directly to Agris, through national input centers, or indirectly through regional centers which identify, select and file domestically produced literature.

Italy participates through the Ministry of Agriculture in Agris via the Euragris regional center represented by the European Community. FAO acts as coordinator of the entire system.

But the most interesting realization is represented bu the activation of the Space Documentation Service (SDS), later known as Information Retrieval Service (IRS) of the European Space Agency (ESA).

Constituted in 1965 with headquarters in Darmastadt, SDS was transferred in 1973 in Italy, in Frascati, becoming the first on-line information service with main offices in our country. IRS, among other things, is equipped with its own internationally reputed network (Esanet).

The presence on the national territory of IRS noticeably contributes to disseminate experience on on-line information in our country.

The on-line access to data bases, however, often represents a courageous initiative by the persons responsible for doucmentation services within large industrial groups or firms particularly interested in scientific and information research. The chemical and pharmaceutical sectors are the most responsive to the advantages offered by on-line information. In the seventies important industries of this sector developed a useful experience and were among the first Italian to have access also to the US services, thanks to the availability of the DARDO service of Italcable (the Agency responsible for intercontinental communications) which affords access to Tymnet and Telenet networks and thus to the USA host-computers.

Experience was thus gathered both on the internationalization of data bases on-line and on the problems related to the setting up of automated files.

About ten years ago large and important Italian data bases started to be implemented, particularly in the juridical, legislative and commercial sectors.

The electronic documentation Center of the Supreme Court was inaugurated in 1973, with the goal of implementing an information automatic system for the dissemination of global juridical data. All types of information on all sort of juridical matters. Numerous working groups were set up for this purpose in which were present magistrates, university professors, officers of State agencies and experts, in order to solve various problems connected with the collection of documents related to ecologic problems or to the state and regional legislation, or to penal law issues, etc.

The implementation of the "Italgiure-Find" system is the outcome of a close cooperation between Univac Italy and a group of magistrates of the Court. Said cooperation enabled not only the realization of a an information retrieval system quite powerful and versatile but also to solve linguistic problems resulting from the processing of italian-language information.

The electronic documentation Center of the Supreme Court started its operations serving a limited and specialized type of user: tribunals, state owned agencies, research bodies and government departments. For this purpose it built its own telecommunication network, using Olivetti terminals.

The procedure for the start of a commercial service open to both Italian and European users was formalized at the end of 1981.

The information system for the automatic documentation center of the House of Representatives (Lower House) is also quite impressive.

Among other things, this system includes the progress situation in Parlament of state laws plus various political control acts (motions, questions, deliberations, agendas, etc.) introduced both in the Lower and Upper House. (House of Representatives and Senate).

Cerved, the informatic company of the Chember of Commerce for Industry, Articrafts and Agriculture, implemented an information system made up of about 7 files with data and information on the Italian commercial and business scenarios.

Around 1978, the Ansa press Agency starts automating its services and sets up a data base on news it transmitted.

A similar initiative was undertaken by the Institute for Foreign Trade.

In addition to the above initiatives, we must also mention numerous other data bases, implemented both by large industries (Fiat) and by Universities and Research Centers. These cover various aresa, such as Fine Arts, International Relations, fiscal legislation, etc.

The above tells us that, however slowly and in a not homogeneous manner, in Italy the situation was becoming favorable for the growth of an on-line information market.

We must also point out that the above illustrated initiatives, even trough characterized by a high technological level and by the quality of their contents, in our mind still present substantial limitations due to a number of factors, such as the availability of the service to a restricted type of user, the lack of an adequate industrial and market oriented policy, the shortage of telecommunication facilities at the national level as well as the absence of a national program supporting the sector and the development of an information market.

The CEE Euronet/Diane project is now part of this scenario.

The rapid evolution of US services, the aggressive commercial policy which placed in Europe numerous access points to the US networks, the continuous offer of ever new data bases produced in the USA also in areas other than scientific-technological, etc., began to have a negative effect on the US-Europe balance of payments. Furthermore, most of the data bases made available by IRS (with the exception of Inspec, Elecomps and Leda) were produced in the USA.

European production of data bases was growing without finding, however, an adequate service structure fit for commercial exploitation. Irs oriented traffic meant the transfer of European currency towards the USA, i.e. royalties paid to the manufacturers of CHEMABS, Compendex, NTIS, BIOSIS, etc. Furthermore, the widening of interest from scientific and technological areas to economic and commercial sectors, caused the need for data and information on national productive and industrial realities, which were certainly not available on US data bases.

In the light of this general situation, the Council of Ministers of the European Community in June 1971 approved a resolution for the purpose of "coordinating the initiatives of member states on the question of scientific and technological information and documentation.

The medium term objective was to promote the creation of an European information market. The short term goal was the implementation of an European telecommunication network.

The start of the Euronet/Diane project certainly represents an opportunity for the speedy evolution of the Italian situation.

The Ministry of Post and Telecommunications (The Post Master General) becomes a member of the European consortium for the execution of the network. This network will have a node (or access point) in Rome and later on a concentrator in Milan.

At the political level, the task of monitoring the project is entrusted to the Ministry for the Coordination of Scientific and Technological Research. Not having its own structure, this Ministry uses experts coming from other Ministries (Health, etc.), Public Agencies and Research Centers (CNR, ENEA, ISS) who are appointed to represent it in various working groups which are active within the CEE.

During the initial years of operations of Euronet/Diane, Italy participates in the endeavour without much yield.

Out of the six centers which had offered themselves as host-computers (Ced, CNUCE, Cilea, Cerved, Csata, CCI) only the first three are now connected with the network and certainly do not provide very useful information for European users.

Euronet, however, has certainly provided the thrust which started-up the Italian industry of on-line information, which now at last is capable of attracting and capturing various forces.

The financing policy of CEE for data base projects and the beginning of Videotel experiments, the success of which will also depend from the quantity and quality of information services offered, will also play a significant role.

Particularly in the area of data base production, there is a grat deal of activity. The constitution of an Association of telematic information suppliers (Afdit) stimulates the awareness process of Italian business. In January 1982, a year after its constitution, Afdit had about 26 members. Among them we find also several brokers.

The Institute for scientific research and documentation of the CNR by the middle of 1982 had identified about 34 data base producers (including many Government agencies), about 96 data bases and approximately 13 brokers.

For the development of on-line information culture, the CNR contribution was particularly significant and more specifically that given by the Institute for scientific research and documentation. Since its constitution the Institute has carried out an intense research activity on problems and methodologies of scientific documentation and information, studying both its traditional aspects as well as those determined by the introduction of new technologies.

Furthermore, in 1979 a Referral Center was set up within the premises of ISRDS.

The Diane Italian Referral Center's task is to channel information requests towards the appropriate documentation centers and services and to provide technical assistance and consultancy, both for tie-ups with the telecommunication network and for the utilization of the information contents of the network. This is the first and so far the only example of public Italian body officially entrusted with promotion, training and assistance tasks in the field of information and documentation automated services.

The Referral Center has the following tasks vis-a-vis its users:

a) to channel information requests to the appropriate information services and centers operating within the framework of the Diane information network;

b) provide assistance and consultancy both for tie-up with the physical network and for the utilization of information resources accessible through the network, favoring possible contacts between the users and the management of the physical network (Post and Telecommunications).

As a logical adjunct of said activities, the Center:

a) carried out promotional work for the utilization of the Diane/Euronet network both autonomously and in cooperation with the EEC, the host-computers and the Ministries of Post and Telecommunications;

b) on request it provides assistance to brokers, to the services and to the operators of the physical network, for marketing purposes.

In order to satisfy these requirements, the Referral Center essentially organizes information, training and research activities CRID supplies information on written, telephone or personal requests on various aspects of on-line in Europe and in the United States (Euronet, Tymnet and Telenet networks). A list of 1,500 names and addresses of potential Italian users of on-line was prepared for this purpose. Information material made up of basic or specific documentation, divided by discipline (chemistry, medicine, environment, energy, etc.) has also been made available.

Promotion is done through the organization of meetings (see Diane/Euronet conference of April 11-12, 1980 at CNR), by means of demonstrative research efforts "una tantum", on various data base aspects, and through the publication and dissemination of a quarterly Crid news bulletin.

The consultancy and training activity takes place by reacting to requests connected with tie-up procedures and facilities with the Diane service and by the organization of seminars...

The evolution of the Italian situation appears all the more important if one considers that during this period the country lacked a national policy for scientific and technical information.

Up to now Italian representative in the CEE participated in the work of the Community on the basis of a generic political good will and of a keen personal interest for the success of the Diane project, without however being able to voice firm national policies.

Recently, however, following the impact of on-line information on the country's economic life, the Ministry for Scientific Research has initiated certain activities for the coordination of the sector' work, and the interest among responsible State officials is noticeably spreading.

It may be well to close this survey by mentioning the situation of the areao-spatial sector.

We must first point out that this sector does not enjoy a special statute and has merely followed the general evolution of the Italian situation.

As of now, the availability of the NASA or Spacecomps file and of the LEDA data base containing the photographs taken by satellites, has not given way to any specific initiative connected with the Italian aerospatial industries or with competent military quarters.

It is to hoped, however, that within the framework of a future national policy for scientific information, adequate initiatives will be undertaken in order to make proper use of available data.

BENEFITS TO INDUSTRY
(OF COORDINATED DEFENCE/AEROSPACE INFORMATION STRUCTURE)

by

Jack Chander and G. Kirouac
Technical Information Service Science & Technology for Development
National Research Council of Canada
Ottawa, Ontario
K1A 0R6

SUMMARY

This paper deals with the need for and the sources of information for the defence aerospace industry. It addresses some of the problems that the industry faces and describes some of the services available in Canada. Finally, it raises the issue of possible modifications to the present information system in an attempt to find solutions to the perceived information problems.

INTRODUCTION

In recent years, Canada's aerospace manufacturing industry shared the fifth place in world sales with Italy and Japan, but in spite of this position, the aerospace defence productivity has remained a comparatively small fraction of the overall activity in this field. Of the 150 companies that make up the sector, 40 account for nearly 90% of the industries' sales and 10 major companies account for approximately 60% of the total. However, concerning Canadian defence, most needs are met by buying off-the-shelf equipment from foreign suppliers. These defence needs are comparatively small and, therefore, do not seem to justify the large investments in defence research and development needed to develop defence aerospace equipment. The following figures are an indication of Canada's position in defence productivity. The Canadian overall aerospace industry employs about 46,000 people and had total sales of $2 billion in 1980; of this total, defence sales amounted to $450 million which can be further broken down into sales of approximately $150 million of products and services conceived by Canadian industry and the remaining $300 million of products and components designed and developed by foreign primes. Consequently, Canada does not seem to have a need for a formal coordinated defence information system as it exists in the leading countries, but there are a number of informally linked services which will be described later on. This paper is, therefore, limited to general considerations on needs, sources of information, problems, etc.

Following this presentation, it would be interesting to hear of the experience and the situation in the major countries with large defence aerospace information systems.

INDUSTRY'S NEED FOR INFORMATION

It is a fact that to stay in business the defence aerospace industry must be competitive. It must sometimes meet very demanding specifications, ensure high quality and be prepared to deliver the goods in time while remaining within the limits of the budgeted contract. Industry must rely on knowledge acquired either through information, experience or research and development. Information is necessary to keep abreast of scientific and technological progress thus enabling the company to select the most appropriate technology or to prevent costly and time consuming research and development. It is also necessary to adopt materials and manufacturing equipment as well as the most efficient production methods.

On account of the very nature of the defence aerospace industry activities, it is almost impossible to accurately assess the direct benefits resulting from the acquisition of information. Nonetheless, it is generally recognized as creating a greater awareness of new trends, of reducing searching time, in preventing duplication of R & D and as an important factor in the reduction of operating costs, capital investments and in improving production and profits.

HOW INDUSTRY OBTAINS ITS INFORMATION

There are a great number of information sources for industry in Canada. This is partly due to a great variety of needs. Information must be available for research as well as for actual manufacturing processes. In order to stay competitive, industries need to increase productivity and ensure quality control in their manufacturing processes. This requires access to state-of-the-art technology and up-to-date knowledge and information.

Information is available in many forms. It is found as printed literature: that is, books, journals, patents, and so on. Advanced electronic equipment, computer networks, (such as CAN/OLE), provide up-to-date information on thousands of topics on a variety of databases. Films, charts, and drawings are excellent methods of visual communication. A

great deal of information is also passed verbally, be it at meetings, conferences, seminars, or courses, or through the "Old-Boy" network. Libraries - government and scientific - such as the Canada Institute for Scientific and Technical Information, documentation centres, etc., give invaluable information to the industries in Canada.

These information sources are often linked according to specific interests in order that industry can obtain information on related topics from a variety of independent sources. At the same time, it is impossible to group all information that may be needed by a group of users.

International agencies such as UNIDO, AGARD, etc., also provide appropriate information to manufacturing industry. Another source of information is the suppliers of materials, equipment, and services.

PROBLEMS ENCOUNTERED BY INDUSTRY

Among the problems most frequently encountered by industry are those pertaining to the release of information. In many cases, a number of constraints such as security clearance, proprietary rights or intellectual property will either delay the transfer of information or even make the release impossible. The more advanced and competitive industries are likely to make the release of information more difficult, especially when they seek new developments that are closely guarded secrets. The timeliness of information transfer has a positively direct effect on the requesting industry, especially for those that need to meet production deadlines, to ensure productivity and maintain competitiveness.

Another difficulty, of more significance to the smaller industry is the ability to identify and locate appropriate resources. For larger firms that have qualified information staff, access to sources is much less complex. Smaller firms, in general, have limited in-house resources and to complicate matters further, they tend to be unaware of the assistance services available.

Finally, there is the problem of adequately formulating the request, a problem that is common to all industries, whether large or small. Once the sources of information have been identified comes the question of expressing the needs in an appropriate context. Requesting a specific document is fairly straightforward but seeking advice for the solution of a problem requires sufficient background information to enable the information service to search for appropriate material. The more background the inquirer can supply, the more valid the answer is likely to be. A well defined problem often carries its own answers. This does not pretend to be an exhaustive list of problems. It nonetheless represents some of the more common.

SITUATION IN CANADA

As mentioned, Canada has no coordinated defence-aerospace information structure. There exists, however, information services and a number of technology support programs and activities which are available as sources of information for the Canadian aerospace industry. Some of these will now be reviewed briefly.

A - Defence Science Information Services (DSIS)

1) What DSIS is and Does

DSIS - The Department of National Defence (DND) Directorate of Scientific Information Services - has been called by some a library, and others an information centre. It is an agency of the Chief, Research and Development Branch of National Defence Headquarters and acts as the central organization for:

- recording the existence of scientific and technical documents dealing with DND research and development and distributing these documents within DND and to allied countries;
- ordering, recording and distributing within Canada, defence research and development documents from foreign sources;
- selective announcement of the existence of scientific and technical information (STI);
- preparing and distributing Document Digests;
- remote-terminal searching for STI;
- preparing bibliographies;
- indexing and storing defence related research, development, test and evaluation documents; and
- providing consultation on techniques and procedures for handling STI.

Documents can be acquired by the Canadian Defence Liaison Staff (London); the Canadian Defence Liaison Staff (Washington); DND personnel attached to British or U.S. military establishments; personnel taking part in bilateral or other international agreements; personnel on visits; or direct receipt from the source.

All DND STI documents intended for foreign release are channelled through DSIS.

2) Services DSIS Offers to Industry

In essence, the DSIS services which are offered to "qualified" industrial contractors fall into three categories of information services: (a) the ordering of defence related STI reports from foreign countries, or the provision of the same from DSIS holdings; (b) the initiation and monitoring of current awareness of SDI services in specific subject areas of the industry's defence interest; and (c) the carrying out of retrospective searches on the DSIS RETRO data base, or the compilation of bibliographies of DSIS holdings. The sum of each of these services is the provision of relevant STI to the industry within the constraints of its contract. Thus, DSIS will send documents pertinent to specific industry's contracts.

a) The ordering of foreign Defence STI basically consists of the following: DND has scientific liaison officers in London, Paris and Washington, and through these offices requests for foreign reports are sent. By far the largest number of orders is through our Washington office which for 1981 received slightly less than 1600 requests for classified contractors. Approximately 20% of such requests are refused and documents may be requested only once. It follows that a good "need-to-know" statement for such request is vital.

b) Requests for ordered documents most often occur as a result of DSIS' SDI Service which has approximately 750 patrons and over 1200 questions in its inventory. Although requests for ordered documents can be filled out the SDI printout gives all the necessary information required to order a document and is used as order form. An SDI profile is constructed after a DSIS Information Scientist has had an interview with the client. These interviews can take place at the Defence Research Establishment, or in the Ottawa office of the Information Scientist. Two different thesaurus's are used as guides to construct the profile in choosing appropriate terminology, they are: (a) TEST - Thesaurus of Engineering and Scientific Terms and DRIT - DAC Reprisal and Indexing Terminology. Both have been produced by the U.S. Department of Defence, Defence Technical Information Center.

   As well as industrial contractors, SDI profiles have been prepared for the Defence Scientists Military officers of Headquarters, Military Colleges, CF Schools and other civilian officers.

c) DSIS also carries out retrospective searches on its RETRO data base, which is a computerized search service listing DSIS holdings from 1969 onwards. Reports of older work can be searched for manually by using the microfilm indexes; however, there is not a great requirement for these records although such searches do take place. Microfilm cassettes of these documents are held by each Defence Research Establishment.

It is DSIS policy to let industry and the DREs contract directly with the National Research Council to do CAN/OLE searches, or with Lockheed or Infomart to perform Dialog or Orbit searches. DSIS will do searching for the CF Bases of Test Establishments which have insufficient resources of their own.

A second data base which DSIS searches is DROLS - the U.S. Defence Research on-line system, which has access to the large volume of classified or limited reports in the holdings of the U.S. Defence Technical Information Center.

It is important to note that DSIS services of supplying documents to companies requires each document be checked against the monthly list of accredited companies, before the document is sent out.

In 1981, 19 companies were registered with DSIS and the service provided 72 Selective Dissemination group profiles to these industries, ordered 174 foreign documents for them, provided 1049 documents on loan or retention and performed 30 retrospective searches on their behalf.

In addition, liaison visits to industry were made to determine their information needs.

3) The DND Interface with the Canadian Military Industrial Complex

As a result of the Federal Government's "contracting out" of research and development policies, there are many industrial companies which have an interface with the Defence Research Establishment or with DSIS. In order to obtain Defence

scientific and technical information through DSIS, however, these companies must have a Defence contract negotiated through the Department of Supply and Services and a valid "need-to-know". This "need-to-know" statement is frequently a synopsis of the company's contract with the Department and is offered as justification for release of a particular document from the Department to the company. Thus, a very important principle emerges: companies must not only have personnel who are security-cleared and secure storage facilities and practices, but they must also have an operational need for the document.

This poses the question of the mechanism which occurs from such a policy. In practice it is found that the Department of Supply and Services (DSS) Industrial Security Division verifies the storage facilities of the company and obtains security clearances of people who will be obtaining access to the information. The Director of Security checks to see that the correct security of the project is maintained and authorizes the highest level of information releasable under the contract. DSIS keeps a list of companies with certified access which is updated monthly. It is DSIS policy to check when access expires and inform the company or terminate service. The list of companies that have or have had access to DSIS services through this policy includes those in the field of aerospace, ordnance and small arms, electronics, ship building and acoustics areas. This gives an idea of the variety and scope of DND industrial activities.

B - Other Services

There are other programs or systems which, although not defence oriented, do provide information to the Canadian aerospace industry. Some of the National Research Council of Canada programs and services are briefly described:

1) Canada Institute for Scientific & Technical Information (CISTI)

As any technology-oriented industrial field, the defence/aerospace industry uses a wide range of information sources covering subject areas from the mission-oriented specific to the general or marginal.

The infrastructure for specific defence/aerospace classified information rests with the DSIS service and related other information services of the Department of National Defence. However, a large volume of the information required by this industry is available from the open literature that can be accessed via public channels; NRC offers many such information sources to support the defence/aerospace industry. NRC has the oldest collection of publications of the Royal Aeronautical Establishment (RAE) held by the NAE branch library. Two data bases of CISTI's CAN/OLE are of particular interest to clients in the aerospace industry: NTIS (report material disseminated by the U.S. National Technical Information Service, Springfield, Virginia) which is backed up by the complete file of full-text reports in microfiche form, and COMPENDEX (the machine-readable Engineering Index file).

The industrial sector is CISTI's largest clientele (43%) which includes the defence/aerospace industry. This sector is routinely served by computer-based (CAN/OLE, CAN/SDI, etc.) as well as by conventional library services (reference, lending/photocopying, etc.).

2) Industrial Research Assistance Program (IRAP)

The NRC Industrial Research Assistance Program (IRAP), which since 1962 has provided financial assistance for applied research projects to be carried out in the laboratories of manufacturing companies in Canada, has been consolidated with NRC's older Technical Information Service, as of 1 April 1981. The six elements of the re-organized IRAP program providing assistance to industry are: the Field Advisory Service, the Technical Information Service, the Contributions to Firms Employing Undergraduates, the Contributions to Laboratory Investigations, the Contributions to Small Projects, and the Contributions to Large Projects.

The two elements of major interest to the Defence/Aerospace Industry are the Technical Information Service and the Contributions to Small Projects.

2) a. The Technical Information Service

The function of NRC's Technical Information Service is to provide scientific and technical information, advice and assistance to Canadian manufacturing industry. The service is especially useful to small and medium-sized industries — firms employing 200 people or fewer and that have no technical staff or limited access to technical documentation; these firms represent about 90 per cent of manufacturing enterprises and account for nearly half the industrial production and employment. Large manufacturers and other industries are also assisted with problems which are outside the area of expertise of their own staff.

TIS is an interface service which helps industry transform or adapt existing scientific and technological knowledge derived from laboratory research or technical documentation into practical applications. It is actively engaged in all the facets of technology transfer which involves: identifying and formulating problems;

gathering, analyzing and interpreting information available from many sources; proposing solutions in terms that can be understood by the user; and assisting in implementing the proposals.

The service thus helps the manufacturing industries to: solve technical problems, improve production operations, increase productivity, develop new processes, products and markets, and reduce costs and increase profits.

The distinctive feature of TIS is its field service. Engineers and scientists visit plants in their territory making clients aware of the availability and value of technical information and assisting them to identify and solve their technical problems and, if necessary, to help define and formulate requests for further assistance. This direct, in-plant, person-to-person contact between the user and the Field Technical Advisers is the essential element of successful technology transfer to industry.

The service is available through 16 offices across the country; these are located such that approximately 80 per cent of potential users are within 50 miles of a field office. A group of specialists at NRC's/TIS National Office in Ottawa provides the necessary technical backup.

Resources available to TIS are many and varied. Primarily, they consist of the individual and collective knowledge and expertise of its engineering and scientific staff, all of whom have had extensive and varied industrial experience; also, of the vast expertise of the scientists and engineers of NRC's laboratories, as well as those of federal and provincial governments, universities and research organizations. It has ready access to the scientific and technical literature of the world through NRC's Canada Institute for Scientific and Technical Information (CISTI). In addition, staff makes extensive use of information available from the various departments at all levels of government, from Commonwealth and foreign governments. Other major sources of information are the larger industries and trade associations which readily provide non-proprietary information.

TIS serves industry through interrelated programs that offer solutions to specific problems; assist with production, operations and productivity improvement; keep industry aware of technological developments pertinent to their interests; extend TIS activities through senior students undertaking short-term projects.

The service is confidential and provided to industry at no charge. TIS does not undertake research or testing programs, nor patent searches, nor design work or market studies. Although some elements of these tasks are used in preparing replies, when a need for this type of service is identified the firms are referred to other government departments or agencies or to appropriate consulting firms.

2) b. Contributions to Large Projects

This element continues to be the major program for assistance to industry for applied research projects lasting for two to three years. Projects must be scientifically feasible, commercially realistic to the applicant's company and have in view marketable end-products or processes for which a demonstrable need or an opportunity is foreseen. Research results should be capable of being exploited through Canadian facilities.

The purpose of the program is to increase the calibre and scope of industrial research in Canada in situations where it leads to high business effectiveness with economic and/or social benefit to Canada. This objective is pursued by extending financial support to approved research workers engaged in approved industrial research projects of high technical merit accompanied by prospects for a high return and good business plans for achieving success.

To be eligible to this program, companies must be incorporated in Canada. The financial assistance covers salaries paid to the participating company's scientific and technical staff engaged in the project, including fringe benefits, and the participation, on a special basis, of university professors or consultants associated with the project.

As of 31 March 1981, NRC has expended $183.0 million on this program for 1313 projects with 655 companies. The companies' share has been about $275.0 million. The electrical and electronic industry received $40.0 million of the NRC expenditure and the transportation industry $3.7 million. Included in the transportation industry was applied research projects for aircraft engines. The primary metals industry received $10.4 million, with some of the projects concerned with new alloys which could have application in the defence industry sector.

2) c. Program for Industry/Laboratory Projects (PILP)

The Program for Industry/Laboratory Projects (PILP) is also administered by the National Research Council and provides funds to Canadian companies that are willing to undertake further work on research results from NRC and all government department laboratories to determine whether commercialization would be economic or whether a specific Canadian opportunity exists. The program supports projects

normally by development of contribution agreements for support from the conceptual stages through to prototype or pilot-plant development within the company. Licences are arranged to permit the recipient use of the government's background technology rights, as required. Any new intellectual property developed by the recipient during the PILP project will be the property of the company. PILP also continues to fund research in industry via procurement contracts.

3) National Aeronautical Establishment (NAE)

The National Aeronautical Establishment has a unique mandate to support the aerospace industry in Canada. To do this, it offers: major facilities and contracted-in research, in-house research programs, as well as PILP type programs previously referred to.

NAE represents Canada on a number of committees such as: the International Committee on Aeronautical Fatigue (ICAF), the Advisory Group on Aeronautical Research and Development (AGARD), Commonwealth Aeronautical Advisory Research Council (CAARC), the Supersonic Wind Tunnel Association and the Subsonic Wind Tunnel Association. Via these various organizations, it ensures that NRC and Canadian industry has access to worldwide literature and technology.

Another major source of information for defence aerospace industry is the Aeronautical and Mechanical Engineering Library. This library which is linked to CISTI is the major Canadian library in the field of aerospace. In addition, bilateral programs and publication exchanges with worldwide aerospace research institutions allow NAE to keep abreast of the latest scientific and technical developments in its field.

As a result of the above activities, NAE has developed: a great store house of high technology aerospace know-how and knowledge; a good awareness of who is doing what to whom in the world; an ability to find solutions to problems posed by Canadian industry; via forefront research, a technology base that can greatly aid industry and is transferred to industry via PILP, IRAP and cooperative research programs; a very comprehensive data base in Aeronautical Library that is extensively used by industry.

Moreover, the latest tools of the division, such as the wind tunnels which are the best in the world and attract many foreign customers are also available to support Canadian industry.

4) Division of Mechanical Engineering (DME)

DME programs support Canadian defence/aerospace industry in two ways:

(i) by direct cooperative research with the aerospace industry. This work does not generally have a direct defence connotation but very frequently the results of the research lead to an enhanced capacity of the industry to meet defence needs. For example - cooperative research on computer simulation, followed by experimental verification, of a new technology for gas turbine fuel controls, and for another company - provision and operation of national facilities (unique in Canada) for altitude testing of small gas turbine engines and Canadian certification of aircraft engines under icing conditions.

(ii) by conduct of core research in designated areas indicated as priority by DND to ensure NRC capacity to respond to particular DND problems as need arises, for example: Helicopter Icing Facility - operated by NRC experienced staff to support helicopter development by NATO countries. Sustaining grant from DND to maintain expertise and facility. Aeropropulsion - maintenance of facilities and basic research on advanced gas turbine operational behaviour. Current studies include participation in AGARD engine exchange program to establish NRC as calibrated reference engine test facility. Advanced Fuels and Engines - gas turbines and diesels. NRC recommends, provides and tests experimental fuels and engine modifications in cooperation with industry suppliers. This includes low temperature operation.

IMPROVING THE INFORMATION SYSTEM

In Canada the aerospace industry works very closely with all government departments and agencies, as well as with other various sources of information. The design and production of Canadarm is an outstanding example of the excellent cooperation between industry and NRC.

Apart from the information sources previously described, there are also several other useful sources in universities and government departments such as the Aerospace Branch of the Department of Industry. Though they are not structured as a coordinated system, they are closely linked to serve a relatively small group from aerospace industries which are concentrated in or around the two Metropolitan centres.

As the Canadian information system develops to meet the increasing demand for information, it might consider ways and means to improve its efficiency and efficacity.

As most information used by the Canadian aerospace industry comes from abroad either through parent companies or external information sources, there are under the present system inevitable delays. More direct access to external networks or sources should be sought thereby reducing the intermediate agents and thus ensuring more timely access to the needed information.

Among the major problems of the smaller aerospace industries is the identification of an appropriate source, especially when their technical staff and other in-house resources are limited. The publication and updating of a directory of information sources for the aerospace industry listing and briefly describing the different services available could save valuable time in seeking the appropriate source of assistance. The marketing of services may also enhance the communication between receivers and donors by alerting users through bulletins on pertinent international and national meetings, seminars, conferences and special reports or other publications of interest.

Finally, the problem of incomplete or badly formulated requests that may result in incomplete, incorrect or delayed answers could be minimized by the introduction of user training courses; that is, instructing users on how to access sources of information.

ACKNOWLEDGEMENTS

The authors wish to acknowledge and thank Jean Baril of the Department of National Defence, Dr. W. Coderre of the National Research Council and their colleagues for their contribution in the preparation of this paper.

In particular, we wish to express our gratitude to Jeannine Charette of NRC for her cooperation and diligence in typing the manuscript.

AVANTAGES POUR L'ETAT D'UNE COORDINATION DE L'INFORMATION DEFENSE ET AEROSPATIALE

par
C. PAOLI
Adjoint au Chef du Département "Organisation-Promotion"
CEDOCAR
26, boulevard Victor
PARIS ARMEES
75996
France

RESUME

Les bénéfices pour les pouvoirs publics résultant de la coordination de l'information dans les secteurs Défense et Aérospatial sont présentés à travers l'organisation du Centre de Documentation de l'Armement (CEDOCAR) pour les informations bibliographiques et factuelles, la Direction des Recherches, Etudes et Techniques (DRET) et ses Contractants pour l'information relative aux programmes de recherche. Les flux et les transferts d'informations au sein des structures de ces organismes sont analysés.

INTRODUCTION

L'intérêt pour l'Etat de coordonner et de contrôler les transferts d'information entre la Défense et le secteur Aérospatial s'impose pour des raisons d'efficacité et d'économie de moyens. Cette coordination devra cependant tenir compte de la spécificité des problèmes de Défense et de l'importance militaire et industrielle du secteur aérospatial qui provient essentiellement :

. du caractère pluridisciplinaire de l'information de Défense/Aérospatiale.

De nombreuses disciplines scientifiques et d'importants secteurs d'activité sont en effet concernés. Ceci explique qu'en France, il n'existe pas de structure de coordination indépendante entre la Défense et le secteur Aérospatial, mais que cette coordination s'exerce dans le cadre plus large d'organisme comme :

- Le Centre de Documentation de l'Armement (CEDOCAR) qui comprend une Division Constructions Aérospatiales et Engins.

- La Direction des Recherches, Etudes et Techniques (DRET) au sein de laquelle plusieurs groupes de recherches sont directement impliqués dans le soutien d'études et de recherches dans le domaine de la navigation et du guidage, des matériaux, de l'aérodynamique, de la physique des solides, etc...

- Certains Organismes contractants de la Délégation Générale pour l'Armement (DGA) et de la Défense, parmi lesquels des Sociétés apportent leur contribution à la constitution des fonds documentaires du CEDOCAR (SNIAS, MATRA, SNPE, ...) en même temps qu'elles en sont leś utilisatrices.

. de la nature des informations traitées.

Deux catégories complémentaires d'information sont à considérer en matière de coordination :

- l'information documentaire classique (ouverte ou protégée), enregistrée dans des banques de données bibliographiques ou factuelles, qui constitue la matière première des organismes de documentation comme le CEDOCAR.

- L'information "non conventionnelle" qui circule à travers une organisation comme la DRET et qui alimente l'activité de coordination de la recherche. Cette information est souvent mal définie et ses flux doivent être maîtrisés et canalisés.

I - ACTIONS SUR LES STRUCTURES DOCUMENTAIRES ET COORDINATION DES TRANSFERTS D'INFORMATION

1) Principes généraux

En matière d'organisation documentaire en Europe, dans le domaine aérospatial, une des premières actions de coordination est due à l'initiative de l'ESRO, qui dès 1964 prîs la décision méritoire de signer avec la NASA un accord lui permettant d'avoir à sa disposition une bande magnétique destinée aux organismes européens avec, en contrepartie, l'obligation de collecter les rapports européens. Cet accord fondé sur une exclusivité concédée à l'Agence Spatiale Européenne (ASE) avait pour avantage de mieux maîtriser la production de la base en élargissant la collecte des documents tout en assurant une certaine exclusivité. Cependant, on peut regretter que la limitation de son utilisation aux seuls organismes fournisseurs de documents ne contribuat pas totalement à une plus grande diffusion de l'information.

Cette expérience met en relief les tendances contradictoires que doivent affronter les pouvoirs publics lorsqu'ils ont à intervenir dans l'organisation et la coordination de l'information, et plus particulièrement lorsqu'il s'agit de la Défense et du secteur aérospatial. L'Etat doit en effet trouver le compromis entre la nécessité de satisfaire le plus largement possible les demandes des utilisateurs et la limitation à apporter à la diffusion des informations couvertes par le secret militaire ou industriel.

SNIAS : Société Nationale Aérospatiale
SNPE : Société Nationale des Poudres et Explosifs

Les objectifs de coordination recouvrent donc deux notions apparemment opposées "mieux diffuser et mieux protéger" que l'on pourrait énoncer de la manière suivante "mieux protéger pour mieux diffuser". Pour cela, trois directions sont à prendre en considération :

1°) Faciliter une diffusion élargie de l'information ouverte en ne liant pas l'accès à la nécessité d'alimenter une banque de données. Cela impose soit une approche service public, soit une approche commerciale, ou les deux, en organisant la collecte systématique, l'analyse et l'indexation à travers des structures de producteurs de banques avec le souci de créer des banques pertinentes et de qualité.

2°) Trouver un moyen terme entre Désenclavement et Rétention de la littérature "grise".

A ce stade il convient de faire une distinction entre le document lui-même, le signalement d'un document et la totalité des signalements d'une banque de données. En matière de documents originaux, la coordination consistera à définir des règles strictes à appliquer selon les différents types de documents afin d'éviter soit une surclassification, soit un manque de classification par l'émetteur lui-même, ou par les autorités de sécurité. En ce qui concerne les signalements de documents, le partage entre banque de données ouverte et banque de données protégée matérialisé par une exploitation sur site informatique séparé ne correspond pas vraiment aux besoins, car il peut conduire à intégrer dans des banques de données protégées des signalements de documents de la "zone grise" et contribuer ainsi à une certaine rétention de l'information, ou bien à introduire des signalements de documents ou des données sensibles dans des banques de données ouvertes et en favoriser ainsi la fuite.

Pour répondre à cette préoccupation certains serveurs et notamment le Serveur National QUESTEL en France ont mis en place une formule dite "banque de données privée" qui permet aux producteurs, tout en limitant l'accès à certaines banques de données aux seuls utilisateurs habilités d'ouvrir cette information à une clientèle élargie. De plus, dans le cadre des procédures d'accès aux serveurs des niveaux différents d'habilitation ont été prévus pour occulter soit la banque de données toute entière, soit plusieurs signalements, soit des sous-ensembles de signalements. Ces moyens mis en oeuvre dans la coordination devraient contribuer au désenclavement de l'information semi-confidentielle dont les usagers sont les plus friands et en même temps à un contrôle plus efficace de la diffusion des informations sensibles.

La querelle entre l'Université de Stanford et le Gouvernement Reagan(1) qui s'est développée récemment illustre bien les difficultés que l'on rencontre pour maîtriser ce problème. Les efforts du gouvernement américain pour amender le "Freedom Information Act" afin de modérer le transfert de technologie et de limiter le flux d'informations scientifique et technique, empiète selon les universitaires sur la coopération scientifique et technique internationale. La Communauté Scientifique américaine se demande si ces restrictions sont réellement avantageuses pour le pays.

Une solution au compromis que doivent trouver les pays développés est probablement liée à l'évolution des logiciels et à la technologie des serveurs ainsi qu'à la répartition des banques de données en sous-ensembles ouverts, semi-ouverts ou fermés. Ceci permettrait de réguler le flux d'informations scientifiques et techniques en favorisant, grâce au développement de la télématique, la création de zones plus ou moins éclairées sur les réseaux, aussi bien au niveau des banques que des serveurs.

3°) Mieux protéger l'information classifiée.

La délimitation plus précise de l'information classifiée "stricto sensu" devrait également contribuer à sa meilleure protection.

Les signalements de documents classifiés, non accessibles en ligne, bénéficient de traitements informatiques spécifiques sur site séparé dotés de tous les moyens de protection qu'offre l'informatique d'une part et les procédures administratives d'autre part (habilitation du personnel, droit d'en connaître etc...).

Ce type d'information délivrée de la documentation "parasite", ayant un volume moins important devrait faire l'objet de véritables banques de données à accès très réservés.

Pour assurer la meilleure coordination possible, il faut donc tout d'abord définir chaque type de documents vis à vis de la protection des informations et s'entendre sur la répartition de cette documentation dans les trois catégories de banques définies précédemment.

- Banques de données ouvertes
- Banques de données protégées ou semi-protégées
- Banques de données classifiées

En réalité le problème fondamental est celui du choix des documents à faire entrer dans la catégorie "banques de données protégées". Si l'on veut développer l'accès aux informations particulièrement intéressantes pour les utilisateurs, c'est-à-dire aux documents ou aux données non classifiés d'origine interne (rapports, comptes-rendus de mission, fiches d'études, etc...), il appartiendra aux organismes producteurs de banques de bien délimiter les signalements documentaires ou des données à répartir selon ces trois types.

Ces principes étant posés, la coordination des circuits d'information dans le domaine Défense/Aérospatial conduit à la prise en compte de l'évolution des structures documentaires classiques et des modifications des flux d'informations qui en découlent.

2) Evolution et coordination des structures documentaires

L'examen de l'évolution de l'organisation documentaire au cours des 20 dernières années, fondée sur les tâches de la chaîne classique de traitement des documents (collecte, analyse indexation, traitement informatique, diffusion) révèle que ces tâches autrefois concentrées dans une bibliothèque ou un centre de documentation se trouvent éclatées dans le nouveau contexte de l'industrie de l'information et tendent à se développer d'une manière délocalisée(2). C'est ainsi que l'on voit apparaître un découpage des activités autour d'organisations professionnelles indépendantes comme :

. Les centres d'analyses et d'indexation (producteurs).

. Les centres de diffusion (serveurs).

. Les systèmes de transmission (réseaux).

. Les centres fournisseurs de documents primaires (bibliothèques).

. Les courtiers (bibliothécaires, documentalistes).

Le premier bénéfice à réaliser pour économiser les deniers publics découle d'une meilleure gestion des moyens disponibles, il conviendra d'agir d'une manière coordonnée sur chaque fonction.

La coordination pour s'exercer correctement doit s'appuyer sur une politique intégrée au plan National et International. L'avantage d'une telle stratégie étant de pouvoir moduler le développement de l'une ou l'autre fonction. C'est ainsi que l'on pourra décider par exemple de favoriser un développement plus rapide de la fonction serveur en chargeant un plus grand nombre de banques de données que celui de la fonction courtier.

Cette évolution a eu des incidences sur des organismes comme le CEDOCAR qui a dû s'adapter pour prendre en compte cette délocalisation des tâches et développer une politique et des actions de coordination pour chaque fonction.

A) COORDINATION DE LA FONCTION PRODUCTEUR DE BANQUES DE DONNEES

La coordination dans le cadre de la fonction producteur portera sur :

- l'analyse de l'existant par le recensement des banques de données susceptibles de contenir des informations ou des données intéressant le domaine Défense/Aérospatial, un tel recensement ayant pour objet :

- de détecter les lacunes en collection de données,

- d'éviter les analyses multiples d'un même document,

- de regrouper éventuellement des sous-ensembles pertinents de plusieurs fichiers en négociant des accords avec les producteurs concernés,

- de créer de nouvelles banques de données,

- de favoriser le recueil de données bibliographiques et factuelles en coordonnant la coopération des grands organismes du domaine Aérospatial.

C'est ainsi que le CEDOCAR a pu constituer un fonds documentaire dans le domaine Défense/Aérospatial, qui permet aux usagers et contractants Défense comme la SNECMA, la SNIAS, le CNES, etc... de bénéficier d'informations bibliographiques très diversifiées dans ce domaine, et pour certains d'entre eux de coopérer à la création du fichier Défense.

Le CEDOCAR collecte également des informations mises à jour en permanence, portant sur les caractéristiques des avions et des missiles.

SNECMA : Société Nationale d'Etudes et de Constructions des Moteurs d'Avions

En ce qui concerne la banque de données produite par le CEDOCAR, à l'instar du fichier NTIS, l'organisation adoptée est un découpage par domaine COSATI parmi lesquels le secteur Aérospatial occupe une place importante. Une sélection effectuée à partir de 17 rubriques COSATI sur ces deux fichiers portant sur 4 ans (1978-81) montre que les recouvrements respectifs Aérospatiale/Défense sont de 30 % pour le CEDOCAR et 13 % pour le NTIS. Ceci tient à l'origine du CEDOCAR qui a été précédé par le Service de Documentation et d'Informations Techniques de la Direction Technique des Constructions Aéronautiques créé en 1944, avant de devenir un établissement à vocation pluridisciplinaire rattaché à la DRET.

- L'aspect technique en imposant aux créateurs de banques une structure inspirée des recommandations de l'UNISIST et l'adoption de normes communes pour la description du contenu de chaque champ (ex.: structure de la banque CEDOCAR).

La définition de méthodes, pour l'utilisation des normes, la normalisation des procédures, l'évolution des lexiques, le contrôle avant saisie, etc... ont des conséquences avantageuses d'un point de vue :

- économique, en facilitant l'exploitation informatique ;

- documentaire, en améliorant le confort des interrogateurs ;

- organisationnel, en évitant une prolifération anarchique de systèmes structurés différemment ce qui permet des échanges plus faciles de données entre organismes producteurs.

B) COORDINATION DE LA FONCTION SERVEUR

La dissémination de l'essentiel de l'information scientifique et technique à travers de gros serveurs nous est imposée par l'environnement actuel. Si l'on admet aisément la centralisation informatique en matière de banques de données bibliographiques, il est plus difficile de concevoir cette même organisation pour les banques de données factuelles, surtout lorsqu'il s'agit de banques de données très évoluées qui offrent en plus de l'aspect proprement documentaire (restitution d'informations factuelles) des possibilités de traitement les données pour l'aide à la décision ou à la conception. Ces banques de données, souvent spécialisées, nécessitent la présence d'équipes de professionnels de haut niveau pour assurer à la fois la collecte, l'évaluation et la critique des données et l'utilisation qui en est faite.

On peut cependant nuancer cette position en admettant que pour certaines banques de données factuelles dont les fonctions sont plus strictement documentaires, l'accès en ligne sur gros serveur soit préconisé (ex.: banque de données ELECOMPS sur ESA).

Par contre, en ce qui concerne les banques de données bibliographiques les avantages d'une exploitation centralisée sont multiples et producteurs d'économies substantielles au niveau de la gestion. On peut citer, sans être exhaustif :

- même logiciel d'exploitation

- une seule équipe d'entretien

- normalisation des mises à jour

- normalisation de la structuration des banques

- normalisation des critères d'interrogation

- meilleure diffusion des banques auprès d'utilisateurs plus nombreux

- normalisation des produits documentaires.

C'est à partir de ces considérations que le CEDOCAR a été conduit à se développer en tant que serveur Défense en ce qui concerne les fichiers bibliographiques et à agir en tant que coordonnateur Défense pour la création de nouvelles banques de données factuelles. Parallèlement au développement de sa fonction serveur, le CEDOCAR a entrepris d'établir des relations privilégiées avec le Serveur National QUESTEL/TELESYSTEMES, fondé sur la complémentarité des services et des banques de données afin d'éviter la duplication des tâches au plan national. Cette association entre le Serveur National et le Serveur Défense doit permettre aux utilisateurs de l'un et l'autre serveur d'avoir accès à un ensemble de fichiers dans des conditions de connexion et de procédures d'interrogations identiques.

Un autre aspect du problème serveur concerne l'accueil de nouvelles banques de données créées pat des organismes divers, dans des domaines plus spécialisés comme les moteurs d'avions ou dans un domaine plus vaste comme l'économie. Ce secteur tend à etre couvert par un serveur comme DRI (Data Resources Incorporated) qui offre en plus à ses clients la possibilité de créer leur propre banque privée sur le serveur en mettant à leur disposition les procédures et les logiciels de création et l'espace disque nécessaire.

Cet état de fait lié au développement de gros serveurs et d'une certaine prolifération de banques de données ne manque pas de poser un certain nombre de problèmes de coordination. Les facilités offertes par ces serveurs contribuent sans aucun doute à drainer une part de l'information sur sites informatiques non contrôlés et participent ainsi à la circulation des données des producteurs aux utilisateurs sans qu'il soit possible d'en maîtriser réellement les flux.

C) COORDINATION DE LA FONCTION COURTIER

L'autre fonction sur laquelle peut s'exercer une coordination est la "fonction courtier" encore appelée "intermédiaire", qui correspond à l'activité traditionnelle des documentalistes et des bibliothécaires à laquelle s'ajoute un aspect commercial de plus en plus important s'expliquant par le contexte concurrentiel lié au développement de l'industrie de l'information. Quel sera son rôle et quel sera la coordination à définir pour une meilleure diffusion des informations !

A cet égard, l'exemple de NERAC(3) (New England Research Application Center) créé en 1966 avec, pour mission, la dissémination de recherche et de technologie de la NASA est riche d'enseignements car il constitue une approche intéressante de ce type d'activité. NERAC a su dépasser en effet le rôle traditionnel d'intermédiaire pour atteindre celui de véritable conseil en information, se posant en interlocuteur privilégié pour qui veut faire progresser sa Société et améliorer ses performances.

Au CEDOCAR, l'activité courtier dans le cadre de la Division Constructions Aéronautiques et Engins, traite les questions pour les clients Défense en offrant en plus des fichiers du CEDOCAR, l'accès aux différents fichiers ouverts dans ce domaine comme le fichier de la NASA, ou en les abonnant à des DSI ou à des DSI Standards (300 thèmes, dont 40 concernent directement le secteur Aérospatial).

D) COORDINATION DE LA FONCTION FOURNISSEUR DE DOCUMENTS PRIMAIRES

La fourniture des documents originaux sélectionnés par les différents modes d'accès au CEDOCAR représente une part importante de l'activité documentaire.

La commande en ligne de documents primaires et bientôt la possibilité de transmettre du texte intégral, impose une organisation coordonnée des bibliothèques et des organismes détenteurs de documents primaires.

Dans ce contexte, le CEDOCAR intervient comme organisme central de collecte de documents internes (rapports, notes techniques, etc...) qui doivent être accompagnés d'un signalement (titre, auteur, résumé) en vue d'une intégration au fichier Défense. Il gère également les achats documentaires des Etablissements de la DGA.

Dans cette activité également l'évolution des logiciels d'interrogation devrait servir de vecteur à une plus grande coordination entre les bibliothèques et permettre des bénéfices importants.

II - ACTIONS SUR LES STRUCTURES ORGANISATIONNELLES ET COORDINATION DE LA RECHERCHE

A) ANALYSE DES FLUX D'INFORMATION

Une coordination décentralisée fonction par fonction ainsi que la maîtrise du développement des structures documentaires permettent de mieux gérer les flux d'information, de mieux appréhender l'utilisation qui en est faite et de mieux détecter les retombées en favorisant le transfert des connaissances :

1°) Entre différents types d'organismes relevant du secteur Défense/Aérospatial. Des travaux récents de P.WIKERS de l'ASLIB(4), concernant les formes de transfert d'information dans différents types d'organisation, ont montré qu'il y a des systèmes communs d'information et que la plupart d'entre eux existent dans chaque département ou fonction d'une organisation et que dans certains domaines comme la recherche, le développement, les systèmes d'information ont atteint un tel niveau d'élaboration qu'ils ne sont pas utilisés dans les autres parties vitales des organisations.

Le rôle de la coordination sera de gérer, d'optimiser l'utilisation de ces transferts.

2°) A l'intérieur d'un même organisme, l'étude d'ASLIB confirme l'idée formulée précédemment concernant les informations souterraines ou semi-confidentielles. Dans l'industrie, et cela est également vrai pour l'industrie de Défense et l'Aérospatiale, la préoccupation la plus importante des bibliothèques et des centres d'information n'est pas seulement l'information documentaire classique, mais également et d'une manière beaucoup plus vitale, d'autres sortes de documents comme :

- l'enregistrement de leur propre expérience (au plan technique et commercial) ;

- des informations sur la gestion d'une firme (performances, production et services offerts)

- l'information souterraine (non publiée) sur les activités des concurrents ou les études en cours.

Ces informations sont souvent enregistrées dans le cadre d'une firme ou d'une organisation sans que les autres partenaires puissent y accéder. Ce phénomène est aggravé au sein d'un même organisme par la dispersion des activités documentaires dans plusieurs départements ou services.

L'analyse d'ASLIB fait donc progresser la compréhension des cheminements de l'information dans des structures documentaires ou autres et permet de mieux appréhender le problème de retombées civiles des recherches, des études ou des réalisations Défense.

Le suivi des flux d'information s'effectue en outre à travers des documents ou des rapports de synthèses. Un exemple intéressant est fourni par un document émanant du Service Research Institute, intitulé "Program for transfer research and impact studies" qui a été préparé pour la NASA(5). Ce document fait l'inventaire des bénéfices obtenus dans 19 secteurs d'activité avec des exemples de transferts additionnels pour chaque domaine et les organisations concernées. Une vue d'ensemble, avec perspectives, est également fournie sur le transfert d'information de la NASA vers d'autres organisations.

On peut constater l'importance de ce genre d'études et les bénéfices chiffrés que les pouvoirs publics peuvent obtenir. En France, ces travaux s'intègrent parfaitement dans les attributions des centres techniques tels que l'IRSID (Institut de Recherche de la Sidérurgie) ou le CETIM (Centre Technique des Industries Mécaniques), dont l'activité peut être rattachée sur le plan documentaire à la fois à la fonction "courtier" et à la fonction "producteur banques de données", et qui sont des éléments actifs à prendre en considération au niveau de la coordination.

Ces centres, en effet, ont aussi des compétences dans un secteur d'activités données (industrie mécanique, soudure, composants, ...). Ils recueillent l'information correspondante pour constituer des banques de données. Ils ont également accès aux autres sources d'information. Ce sont donc eux qui seront mieux à même de réaliser les documents de synthèse dont les résultats pourront faire l'objet de banques de données.

La coordination doit porter aussi sur les transferts d'information entre le monde universitaire et la Défense. Les échanges à ce niveau paraissent plus difficiles à maîtriser, car les relations entre une découverte sur le plan fondamental ou un progrès technique ne laissent pas forcément percevoir les applications qui peuvent en découler. Il semble qu'aux U.S.A. le problème soit mieux traité qu'en Europe, particulièrement en France où il existe un "écart technologique" entre le monde universitaire et l'industrie dû à un manque de communication. Dans le meilleur des cas des universitaires créent eux-mêmes leurs propres sociétés pour promouvoir le développement de leurs découvertes. Dans la Défense, dès la création de la DRME en 1960, qui est devenue ensuite la DRET, cette insuffisance a été comprise et une structure mixte a été mise en place. Elle est constituée de groupes de recherches dans lesquels sont associés des ingénieurs, des militaires et des universitaires. Les flux d'information étant canalisés par différents acteurs comme le CEDOCAR, les groupes de recherches de la DRET, l'industrie, les Etats-Majors et l'Université.

Pour les mêmes raisons que pour l'organisation documentaire il n'existe pas de structure indépendante de coordination Défense/Aérospatiale en matière de recherche et de développement. La variété des domaines concernés en est certainement la cause principale. On peut cependant, au travers de l'organisation de la DRET, apprécier l'importance de ce secteur et les différents services ou organismes qui y participent. Le concept de R.D.E. recouvre toutes les opérations allant de la recherche fondamentale jusqu'à la mise au point de prototype. Mais dans le cas particulier du secteur aérospatial le lancement du développement d'une application ou d'un matériel est une décision lourde de conséquences financières, industrielles et opérationnelles.

L'analyse des flux d'information entre les parties concernées, fait apparaître une organisation coordonnée qui s'appuie sur les structures même des organismes impliqués et sur l'organisation de l'exploitation documentaire actuelle. On a ainsi construit un système, dont les rouages ou les acteurs sont les différents services concernés. Il faut cependant que les acteurs jouent le jeu. Pour cela il faut les aider par l'information et la formation sous peine d'aboutir à ce que Michel CROZIER et Erhard FRIEDBERG appelleraient une "non organisation"(6).

B) PLANIFICATION DES RECHERCHES (7)

Au sein de la DRET, l'organisation des recherches, études de Défense s'est inspirée dans sa méthodologie de la "théorie des systèmes" développés depuis les années 60 et cela conduit à la mise en place d'une structure de Veille et de Gestion Scientifique des Recherches de Défense. Ce modèle permet la collecte d'informations sur des idées, les projets, les résultats de recherche, les éléments budgétaires en vue d'une gestion automatisée de ces données, la réalisation de synthèses destinées à remonter jusqu'aux décideurs et dans certains cas jusqu'au Ministre de la Défense.

Une distinction nette entre les "développements décidés" et les opérations de recherche et d'études en amont de ces développements a été établie.

Les développements décidés sont traités au coup par coup sur décision du Ministre, après étude technique, opérationnelle, financière, en coordination avec les Etats-Majors, les Directions et Services du Ministère.

Les recherches amont font l'objet de procédures particulières qui visent à :

- diversifier des organismes contractants,
- concentrer et coordonner les services du Ministère responsable de l'orientation et de la programmation des études.

Les organismes ayant en charge les études sont :

- les Etablissements, Laboratoires et Centres Techniques de la DGA.
- Les Etablissements Universitaires.
- Les Sociétés privées : MATRA, SNIAS, SNECMA, DASSAULT...
- Les Organismes nationaux comme le CNES (Centre National d'Etudes Spatiales).
- Les Organismes de recherche placés sous la tutelle de la DRET comme l'Office National d'Etudes et de Recherches Aérospatiales (ONERA) et l'Institut Franco Allemand de Saint-Louis (ISL).

La DRET, grâce à ces Organismes, dispose donc de moyens propres qui lui permettent d'intervenir directement sur la programmation des études jusqu'à la réalisation des matériels. Avec l'ONERA elle participe d'une manière prépondérante aux activités du secteur Aérospatial en apportant sa contribution aux études et travaux du CNES, de la DGAC (Direction Générale d'Aviation Civile), des Directions Techniques de la DGA (essentiellement DTEN (Direction Technique des Engins) et DTCA (Direction Technique des Constructions Aéronautiques). L'ONERA, par ses liaisons avec les universités et l'industrie, assure les transferts d'informations et de technologies sur les programmes en cours auprès des constructeurs de matériels aérospatials à usage civil ou militaire.

Avec l'ISL, la DRET s'appuie sur un organisme de recherches doté de moyens importants pour les études balistiques (champ de tir, soufflerie, ...).

La coordination des études amonts se fait au travers d'organismes d'orientation et de programmation qui ont pour tâche de réaliser une concertation étroite entre les intéressés pour établir une confron tation permanente entre les besoins militaires et les potentialités scientifiques et techniques, ce sont :

. le CRED (Conseil de Recherche et Etudes de Défense)

. le GROUPS (Groupe de Planification et d'Etudes Stratégiques)

. le Conseiller Scientifique auprès du Ministre

. la DRET (Direction des Recherches, Etudes et Techniques) dont les missions sont :

- la coordination et la réalisation de recherches, d'études, soit au sein de la Défense, soit par des contrats passés à l'extérieur de la Défense ;
- la coordination technique des domaines communs à plusieurs directions ;
- la coordination des programmes de recherche études amont .

Pour ces dernières missions, la DRET s'appuie sur le GTPI (Groupe de Travail Permanent Interdirection) créé en 1969.

La DRET assure en outre la surveillance d'un certain nombre de domaines scientifiques et techniques susceptibles de connaître à plus ou moins long terme des développements conduisant à des applications intéressant la Défense.

Les relations qui s'établissent entre les structures de la recherche (service des recherches) et les structures documentaires (CEDOCAR) joue un role clé dans les transferts d'information. Doté d'une cellule documentaire avec des spécialistes de l'interrogation, la DRET reçoit systématiquement un volume important d'informations sous forme de documents primaires ou secondaires et accède, via le CEDOCAR, aux différentes banques de données qui lui sont utiles. Les informations obtenues permettent d'une part de mettre à jour les différents dossiers scientifiques et de répondre aux demandes de recherches bibliographiques émanant d'ingénieurs de la DRET.

Dès qu'un nouvel axe de recherche est retenu, divers modes d'actions sont possibles :

. constituer des fiches et les diffuser aux différents services de la DRET intéressés ;

. effectuer des recherches bibliographiques complémentaires qui permettent de mieux cerner le sujet et constituent un bilan sur les études en cours en France et à l'étranger ;

. constituer un dossier sur le sujet puis le diffuser lorsqu'il atteint une taille critique ;

. rédiger une fiche de synthèse ;

. rédiger un rapport interne ;

. rédiger un rapport de mise au point par un expert du domaine concerné ;

. passer un contrat à une équipe scientifique universitaire ou autre apparue comme compétente dans le domaine concerné.

Des réunions sont organisées par la DRET. Cela permet une meilleure symbiose entre les différents groupes du Service des Recherches, des Industriels, des Universités et des Directions Techniques et facilite le transfert éventuel de ces études au terme des recherches pour un développement ultérieur.

D'une manière générale les travaux qui concourent tous à faire le point sur la situation nationale et internationale dans les domaines scientifiques et techniques les plus divers contribuent à donner des arguments d'arbitrage aux responsables des programmes sur les choix à faire compte tenu d'une enveloppe budgétaire qui n'est jamais extensible à volonté.

C - LA COORDINATION DES RECHERCHES

Le système de planification et de programmation des recherches et études engage des opérations sur trois ans ; la planification étant établie à partir :

- des informations à caractères opérationnels en provenance des Etats-Majors.
- Des informations scientifiques et techniques en provenance de la DGA.
- Des informations scientifiques provenant d'études prospectives effectuées dans le cadre Veille Scientifique et Technique (VST).

Le Groupe de Planification et d'Etudes Stratégiques prépare les objectifs unitaires de recherche qui constituent la Directive Ministérielle d'Orientation (DMO).

L'ensemble des recherches et études amont , une fois décidées sont programmées dans le cadre de 2 programmes distincts :

. le Programme Pluriannuel des Recherches et Etudes (PPRE)

. le Programme Pluriannuel des Développements Exploratoires (PPDE).

Le PPRE, qui s'appuie sur la DMO, définit chaque opération sous forme de fiches de recherches - études, à la fois sous l'aspect technique et financier.

Le PPDE est préparé dans de meilleures conditions que le PPRE, mais s'y ajoute un examen financier sous la responsabilité de la Direction des Programmes et Affaires Industrielles (DPAI) qui soumet le projet au CRED et au Ministre.

D - LA GESTION DES RECHERCHES

La planification des recherches et études, mise en oeuvre à la DRET, s'appuie également sur une banque de données automatisée qui sert aux différents groupes de recherches pour l'organisation des programmes de recherches et des études à longs termes et à la gestion financière et administrative des différents contrats. Cette banque qui enregistre les références de chaque contrat, le nom du titulaire, les éléments financiers, ..., représente un véritable outil d'aide à la décision en matière de coordination des recherches.

L'utilisation du dispositif de coordination de la DRET permet aux ingénieurs responsables des groupes de recherches de suivre une recherche depuis sa conception jusqu'aux applications qui se concrétisent dans l'industrie. C'est le cas, par exemple, des matériaux Carbone-Carbone étudiés sous contrat DRET par la Société Européenne de Propulsion (SEP), développés par la Direction Technique des Engins (DTEN), dont le transfert d'application est en cours vers le secteur Médical pour la confection de prothèses de hanches.

Un autre exemple qui implique à la fois le secteur Recherche et les structures documentaires montre que souvent les bénéfices obtenus sont assez éloignés de l'application que l'on a voulu soutenir et développer.

C'est ainsi, que sous l'impulsion de la DRET, à partir d'une banque de données portant sur l'enregistrement des mensurations du corps humain, a été constitué un véritable système d'aide à la conception dont le développement et la réalisation ont été confiés au Laboratoire d'Anthropologie et d'Ecologie Humaine de la Faculté de Médecine de Paris. Cette banque de données est utilisée pour des études d'habitabilité des cabines de véhicules aéronautiques ou terrestres.

Le système de planification mis en oeuvre à la DRET permet également de cerner le coût des opérations engagées et de contrôler en temps réel les dépenses relatives à chaque programme, le secteur Aéronautique-Engins représentant près de 40 % des crédits RDE.

CONCLUSION

Le complexe coordonné "Information-Recherche-Industrie" s'appuie sur une structure de base "Défense" dont le secteur aérospatial est un sous-ensemble. Les organismes qui y participent appartiennent au secteur étatique (CEDOCAR, DRET, Universités) et au secteur para-étatique (Sociétés Nationales). On observe cependant un partage inégal des tâches.

Dans l'organisation de l'information, l'Etat joue un rôle essentiel de centralisation de la collecte et de coordination de la distribution des produits documentaires, le secteur privé n'intervenant qu'en qualité de coopérant et d'utilisateur des systèmes.

La répartition des activités de Recherche-Développement semblent en revanche mieux établies, l'Administration assurant le financement des recherches et le secteur privé les développements militaires et civils.

Sur le plan des théories de l'organisation et de l'analyse des systèmes, on retrouve dans l'ensemble ainsi institué, le modèle synoptique classique d'organisation à-priori (gestion des recherches) associé à un modèle de coordination à-postériori (structure coordonnée d'information).

Cette complémentarité de structure, en favorisant les transferts d'information et de technologies, permet des bénéfices importants pour la Défense et le secteur Aérospatial provenant :

- de la gestion améliorée des informations ouvertes et protégées,
- de la coordination des efforts et des moyens,
- du suivi des activités RDE à travers les organismes concernés.

BIBLIOGRAPHIE

(1) GINA. KOLATA - Technology transfert : New Control Urged
Science vol.215 - février 1982 - pp.635-636.

(2) A. YANEZ - Facteurs non techniques qui influenceront les systèmes d'information
AGARD Conference pre-print n° 204 - août 1981.

(3) D.U. WILDE - Maximizing user benefit from technical Information Center
AGARD Conference pre-print n° 1979 - septembre 1975.

(4) P. WIKERS
Alan GILCHRIST - Patterns of information transfer storage and retrieval in various types of organisation proceedings of ASLIB Conference - 6-8 April 1981.

(5) - Space benefit - the secondary application of aerospace technology in other sectors of economy - NASA N-29060 - 174 p.

(6) M. CROZIER
E. FRIEDBERG - "L'acteur et le système" - Edition du Seuil.

(7) - La Recherche de Défense - La Veille Scientifique et Technique
(non publiés - DRET 1981).

COORDINATION DANS LE CADRE DES STRUCTURES .DOCUMENTAIRES

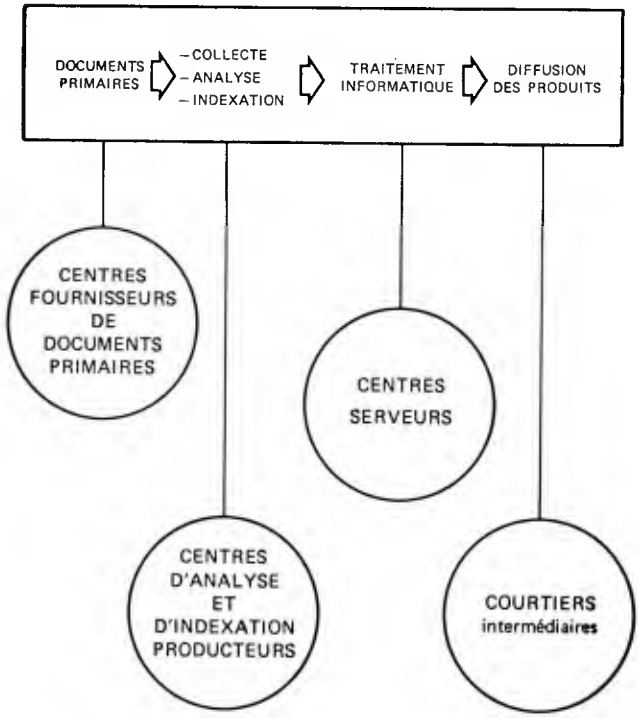


Planche 1

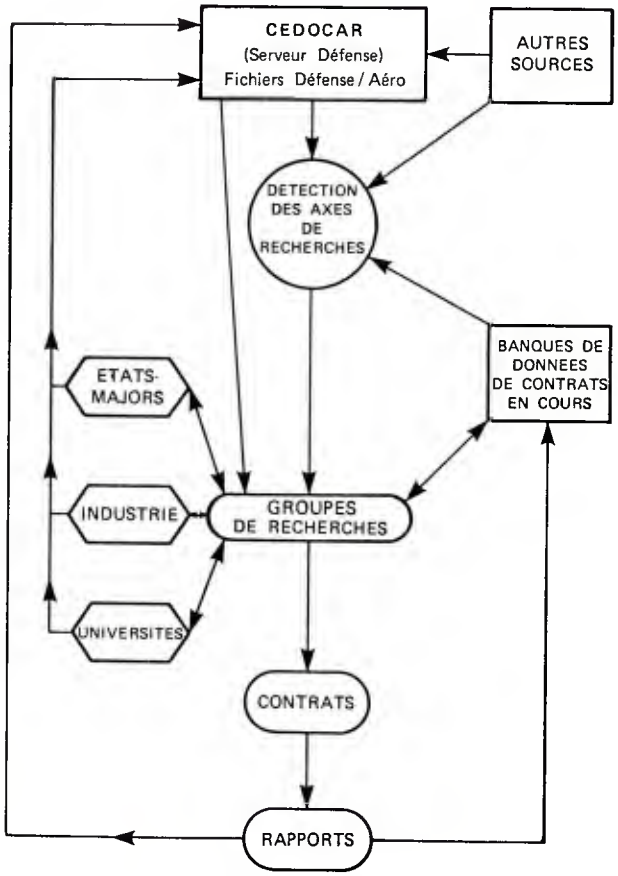


Planche 2

PLANIFICATION DES RECHERCHES

– porte sur trois ans :

– les informations proviennent :

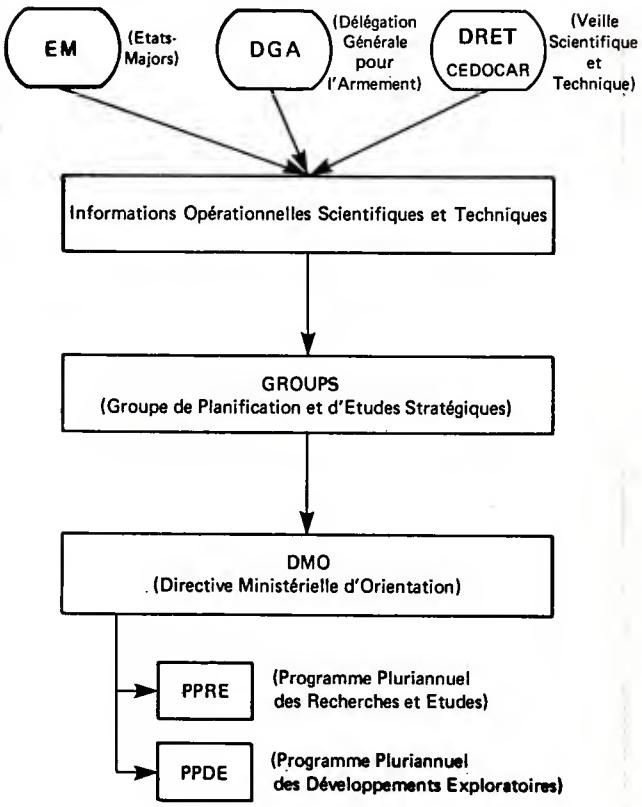


Planche 3

ADVANTAGES GAINED BY THE GOVERNMENT FROM A COORDINATION OF DEFENSE-AEROSPACE INFORMATION

by
C. PAOLI
Deputy Departmental Manager for "Organization-Promotion"
CEDOCAR
26, Boulevard Victor
75996 PARIS ARMEES - FRANCE

SUMMARY

The benefits derived by government authorities from the coordination of information in the sectors of Defense and Aerospace are described through the organization of the Armament Documentation Center in French : "Centre de Documentation de l'Armement" (CEDOCAR) - as regards bibliographic and factual information, the Research Design and Engineering Directorate, referred to as "Direction des Recherches Etudes et Techniques" (DRET) and its Contractors as regards information relating to research programs. An analysis of data flows and transfers within the structures of these agencies is given.

INTRODUCTION

The interest drawn by the government from the coordination and transfer of information between Defense and Aerospace is obvious for effectiveness and resource-saving reasons. However, such coordination will have to take into account the specificity of Defense problems as well as the military and industrial importance of the aerospace sector which mainly stems from :

. the multifarious nature of Defense/Aerospace information.

As a matter of fact, many scientific branches and important sectors of activity are involved. This is the reason why, in France, there is no independent coordinating structure between Defense and Aerospace, but this coordination is exerted within the wider framework of such agencies as :

- The "Centre de Documentation de l'Armement" (CEDOCAR), which includes an Aerospace and Missile Division.

- The "Direction des Recherches Etudes et Techniques" (DRET), within which several research groups are directly involved in the support of designs and research pertaining to navigation and guidance, materials, aerodynamics, solid state physics...

- Some contracting Agencies of the Office of the Minister's Deputy for Armament, known as "Délégation Générale pour l'Armement" (DGA) and Defense, including companies which contribute to the build-up of documentation for CEDOCAR (SNIAS , MATRA , SNPE) of which they also are users.

. the nature of the information dealt with.

Two additional categories of information are to be considered in terms of coordination :

- Conventional documentary information (open or classified) stored in bibliographic or factual data banks, which makes up the basic constituent for documentation agencies such as CEDOCAR.

- "Non-conventional" information which is flown through an agency such as DRET and feeds research coordinating activity. This information often lacks precision and its flow must be mastered and channeled.

I - ACTIONS UPON DOCUMENTARY STRUCTURES AND COORDINATION OF INFORMATION TRANSFERS

1) General policy

As regards documentary organization in Europe, in the aerospace field, one of the earliest coordinating measures resulted from an initiative of ESRO who, as soon as 1964, made the commendable decision to sign an agreement with NASA which enabled them to have at their disposal a magnetic tape intended for European agencies, with, in reciprocation, an obligation to collect European reports. This agreement, based upon an exclusive right granted to the European Space Agency (ASE for "Agence Spatiale Européenne"), presented the advantage of better mastering the basic production by widening the collection of documents, while insuring some degree of exclusiveness, However, it is regrettable that the limitation of its use to document suppliers only did not fully contribute to a wider dissemination of information.

SNIAS = Société Nationale Aérospatiale (National Aerospace Company)
SNPE = Société Nationale des Poudres et Explosifs (National Company of Powders and Explosives).

This experience highlights the contradictory tendencies which government authorities are confronted with, when they have to interfere with the organization and coordination of information and, more particularly, when Defense and the aerospace sector are involved. As a matter of fact, public authorities must find a compromise between the necessity of meeting the users' requests as much as possible and the limitation to be applied to information protected by military or industrial classification as "secret".

Therefore, the aims of coordination encompass two apparently opposing notions : "to better disseminate and better protect" which could be stated as follows : "to better protect in order to better disseminate". For that purpose, three directions must be taken into account :

1°) To facilitate a wider dissemination of unclassified information by avoiding to associate the access to such information to the need to feed a data bank. This demands either an approach by government authorities or a commercial approach, or both, while organizing systematic collection, analysis and indexing through bank producers' structures with a view to creating quality and pertinent banks.

2°) To find a middle course between release and retention of "grey" literature.

At this stage, it is advisable to discriminate among the document itself, the abstract of a document, and the whole set of the abstracts of a data bank. As regards original documents, their coordination will consist in defining strict rules to be applied according to the various types of documents in order to avoid either an excess of classification or a lack of classification by the originator himself of by security authorities. As regards document descriptions, a discrimination between open data bank and protected data bank materialized by the use of a distinct automatic data processing site does not really meet the needs because this may lead to integrate the descriptions of "grey field" documents into protected data banks, thus contributing to a certain retention of information or to introduce document descriptions or sensitive data into open data banks thus facilitating their escape.

To meet this preoccupation a number of suppliers, and namely QUESTEL, the national supplier in France, have set up a system called "private data bank" which allows producers to open this information to a wider variety of customers while restricting the access to some data banks to authorized users only. Moreover, as regards procedures for the admission of suppliers, different levels of clearance have been determined in order to close up either the data bank as a whole or several descriptions, or description sub-units. These measures taken with a view to coordination should contribute to the disentanglement of semi-confidential information mostly appreciated by users, as well as to a more effective control of the dissemination of sensitive information.

The controversy between Stanford University and the Reagan Administration(1) that developed recently highlights the difficulties encountered in solving this problem. All efforts made by the American Administration to amend the Freedom of Information Act in order to mitigate the transfer of technology and limit the flow of scientific and technical information encroach - in the academic people's view - on international scientific and technical cooperation. The American scientific community is wandering if such restrictions are really profitable to the country.

A solution to the compromise that developed countries have to find is probably in connection with the development of sofwares and the suppliers' technology as well as with the division of data banks into open, semi-open or closed sub-units. This would make it possible to regulate the flow of scientific and technical information while favoring the creation of more or less highlighted areas in the networks through the development of telematics, at both banks' and suppliers' level.

3°) To better protect classified information.

A more precise delimitation of "stricto sensu" classified information should also contribute to its better protection.

The descriptions of classified, documents which are not directly accessible take advantage of specific automatic processing on separate sites equipped with all the protective means provided by automatic data processing on the one hand, and administrative procedures on the other hand (personnel's clearances, right to cognizance, etc.).

As this type of information, free of "parasite" documentation, has a smaller volume, it should be reserved for real data banks accessible to a very limited number of users.

Therefore, to insure the best possible coordination, it is first necessary to define each type of documents in terms of protection of information and to find an agreement on the distribution of this documentation into the above mentioned bank categories :

- Open data banks
- Protected or semi-protected data banks
- classified data banks

Actually, the basic problem lies in the selection of documents to be entered into the "protected data bank" category. If we wish to develop the access to the information of particular interest from the users viewpoint, i.e. to unclassified documents or data internally generated (reports, records of missions, survey sheets, etc.) it will the responsibility of bank producing agencies to clearly determine the limits of documentary descriptions or data to be distributed in accordance with these three types.

This policy being specified, the coordination of information networks in the Defense/Aerospace field leads us to take into account the changes occured in conventional documentary structures as well as in the resulting information flows.

2) Evolution and coordination of documentary structures.

A survey of the evolution of documentary organization in the last 20 years based on the tasks of the conventional chain used for processing documents (collection, analysis/indexing, computerization, dissemination) shows that these tasks formerly concentrated within a library or a documentation center are now scattered in the new concept of information industry and tend to develop in a de-located manner(2) Hence the distribution of activities among self-contained professional agencies such as :

. Analysis and indexing centers (producers)
. Dissemination centers (suppliers)
. Conveying systems (networks)
. Primary document supply centers (libraries)
. Brokers (librarians, information scientists).

The first profit to be realized in order to save public funds stems from a better management of available resources; it will be suitable to act in a coordinated manner upon each function.

To be correctly exerted, coordination must be based on a nationally and internationally integrated policy, the advantage of such strategy being the ability to modulate the development of either function. In this way it will be possible, for instance, to opt for a quicker development of the supplier's function by loading a greater number of data banks than that of the broker's function.

This development had an influence on agencies such as CEDOCAR which had to conform itself to the necessity of taking into account this "de-location" of tasks and to develop a coordinating policy for each function.

A) COORDINATION OF THE DATA BANK PRODUCER'S FUNCTION

As part of the producer's function, coordination will be applied to :

- the analysis of existing information through the recording of data banks likely to contain interesting information or data in the field of Defense/Aerospace; such recording is intended to :

  - detect gaps in data collection,
  - avoid multiple analyses of the same document,
  - group relevant sub-units of several files if need be by negociating agreements with the producers concerned,
  - set up new data banks,
  - facilitate the collection of bibliographic and factual data by coordinating the cooperation of major aerospace agencies.

CEDOCAR was thus in a position to make up a documentary fund in the Defense/Aerospace field enabling Defense users and contractors such as SNECMA*, SNIAS, CNES, etc. to benefit by highly diversified information in this field and, for some of them, to cooperate in the development of a Defense file.

CEDOCAR also collects permanently up-dated information on the characteristics of aircraft and missiles.

As far as the data bank produced by CEDOCAR is concerned, in imitation of the NTIS file, the selected organization is a division into COSATI fields among which the Aerospace sector has a large share. A selection among 17 COSATI entries in these two files over a period of 4 years (1978-81) shows that respective Aerospace/Defense overlappings are 30 % for CEDOCAR and 13 % for NTIS. The reason for that is the origin of CEDOCAR which was preceded by the "Service de Documentation et d'Informations Techniques de la Direction des Constructions Aéronautiques" (Technical Information Service, Aircraft Manufacture Directorate) established in 1944 prior to becoming a multi-branch oriented agency attached to DRET.

- The technical aspect, by compelling bank producers to adopt common standards for the description of each field contents (e.g. CEDOCAR bank structure).

The definition of methods, for the use of standards, the standardization of procedures, the evolution of glossaries, the control before seizure, etc. have profitable spin-offs from :

  - an economic viewpoint, due to an easier use of automatic data processing ;
  - a documentary viewpoint, due to an improved comfort of interrogators ;
  - an organizational viewpoint, by avoiding an anarchical proliferation of systems with different structures, thus facilitating data exchange among producing agencies.

B) COORDINATION OF THE SUPPLIER'S FUNCTION

The dissemination of the main part of scientific and technical information through big suppliers is laid on us by to-day's environment. If data processing centralization in terms of bibliographic data is easily acceptable, it is more difficult to conceive the same organization for factual data banks, particularly in the case of highly sophisticated data banks which have the capability of processing data to assist in decision making or in concept forming, in addition to the purely documentary aspect (restitution of factual information). These frequently specialized data banks require the presence of high-level professional teams to ensure data collection, evaluation and critique as well as to use this data.

* SNECMA = Société Nationale d'Etudes et de Constructions de Moteurs d'Avion (National Company for Aircraft Engine Design and Manufacture).

However, this position may be mitigated, admitting that for some factual data banks whose functions are more strictly documentary a direct access by means of a large supplier is recommanded (e.g. ELECOMPS data bank using ESA).

On the contrary, as regards bibliographic data banks, the advantages of a centralized use are numerous and produce substantial savings in terms of management. Let us mention, in particular :

- a common operating software
- a single maintenance team
- up-dating standardization
- bank structuring standardization
- standardization of interrogation criteria
- better dissemination by banks to more users
- standardization of documentary products.

From these considerations CEDOCAR was led to expand as Defense supplier as far as bibliographic files are concerned and act as Defense coordinator for the setting-up of new factual data banks. Parallel to the development of its function as supplier, CEDOCAR undertook to establish priviledged relations with QUESTEL/TELESYSTEMES, the National Supplier, based on the complementarity of services and data banks in order to avoid duplication of tasks at national level. Such association between the National Supplier and the Defense Supplier must allow the users of either supplier to have access to a set of files under similar conditions of connection and interrogation procedures.

Another aspect of the supplier problem is the welcome extended to new data banks set up by various agencies, in more specialized fields such as aircraft engines or in a wider field such as economy. This sector tends to be covered by a supplier like DRI (Data Resources Incorporated) which additionally provides his customers with the ability to set up their own private bank on the supplier, putting at their disposal set-up procedures and softwares and the necessary disk space.

This state of fact due to the development of big suppliers and a certain proliferation of data banks was bound to pose a number of coordination problems. The facilities offered by these suppliers undoubtedly contribute to drain part of the information on non-controlled computerized sites and thus participate in the data flow from producers to users, without being able to master the flows really.

C) COORDINATION OF THE BROKER'S FUNCTION

The other function to which coordination may be applied is the "broker's function" also called "go-between's function" which corresponds to the information scientists' and librarians' traditional activity to which is added a more and more important commercial aspect due to the competitive context associated with the development of information industry. What will be its role and what will be the coordination to be defined for a better dissemination of information.

In this respect, the example of NERAC (3) (New England Research Application Center) established in 1966 for the purpose of NASA research and technology dissemination is full of lessons because it constitutes an interesting approach to this type of activity. As a matter of fact, NERAC went beyond the traditional role of go-between to reach that of actual information adviser, acting as a priviledged interlocutor for anybody who wants his company to progress and improve its performance.

At CEDOCAR, the broker's activity within the framework of the "Division des Constructions Aéronautiques et Engins" (Aircraft and Missile Department) deals with the questions on behalf of Defense customers and, in addition to CEDOCAR files, offers access to different open files pertaining to this field, such as the NASA file, and have them subscribe to SDI's or Standard SDI's (350 subjects, among which 40 are directly related to the Aerospace sector).

D) COORDINATION OF THE PRIMARY DOCUMENT SUPPLIER'S FUNCTION

The supply of original documents selected using the various methods of access to CEDOCAR is a substantial part of the documentary activity.

Primary document in-line ordering and, in the near future, the capability of conveying an integral text demand a coordinated organization of libraries and agencies holding primary documents.

In this context, CEDOCAR acts as a central agency for collecting internal documents (reports, technical notes, etc.) which must be accompanied by a description (title, author, abstract) with a view to their integration into the Defense file. It also manages documental purchases by DGA agencies.

The development of interrogation softwares is also expected to assist in this activity by increasing the coordination between libraries and to bring substantial benefits.

II - ACTIONS ON ORGANIZATIONAL STRUCTURES AND RESEARCH COORDINATION

A) INFORMATION FLOW ANALYSIS

A decentralized coordination, broken down into functions together with the mastery of documentary structure development bring about a better management of information flows, a better apprehension of its use and a better detection of fallouts while favoring the transfer of knowledge :

1°) Among different types of agencies belonging to the Defense/Aerospace sector. A recent survey by P. WIKERS of ASLIB (4) about the patterns of information transfer in various types of organization has shown that there are common information systems, that most of them exist in each agency department or function and that, in some fields such as research and development, information systems have reached such a level of sophistication that they are not used in the other vital parts of agencies.

The role of coordination will be to manage and optimize the use of these transfers.

2°) Within the same agency, ASLIB survey confirms the above notion about underground or semi-confidential information. In the industry - and this is also true in terms of Defense industry and Aerospace - the greatest preoccupation of libraries and information centers is not only conventional documentary information but also and much more necessarily other sorts of documents such as :

- records of their own experience (technically and commercially speaking)
- information on the management of a firm (performance, production and services offered)
- underground information (not published) on competitors' activities or studies in progress.

This information is often recorded within the framework of a firm or an agency and other partners may not have access to it. This phenomenon is aggravated within the same agency through the scattering of documentary activities into several departments or services.

Thus ASLIB analysis promotes the understanding of information approaches in documentary or other structures and provides a better apprehension of the problem of civil fallouts stemming from Defense research, studies or developments.

Moreover, the follow-up of information flows is carried out through documents or synthetical reports. An interesting example is given by a document issued by the Service Research Institute under the title : Program for transfer research and impact studies prepared for NASA (5). This document inventories the benefits gained in 19 sectors of activity and gives examples of additional transfers for each field and the agencies involved. An overall view with prospects is also provided on information transfer from NASA to other agencies.

The importance of this kind of survey and calculated benefits drawn by public authorities are obvious. In France, this sort of work fits perfectly into the competence of such technical centers as IRSID (Institut de Recherche de la Sidérurgie : Siderurgy Research Institute) or CETIM (Centre Technique des Industries Mécaniques : Technical Center for Mechanical Industries) whose activity may be documentarily related both to the "broker's" function and to the "data bank producer" 's function and which are active elements to be taken into account as regards coordination.

As a matter of fact, these centers are competent in a sector of given activities (mechanical industry, welding, components...). They collect the corresponding information to make up data banks. They also have access to other sources of information. Therefore, they are in the best position to prepare synthesis documents the results of which will be fed into data banks.

Coordination must also be brought to bear on information transfer between University an Defense. At this level, exchanges seem to be more difficult to master, because the relationship between a discovery in the fundamental field and a technical progress do not necessarily show the applications likely to result from them. It seems that the problem is better dealt with in the United States than in Europe and particularly in France where there is a "technological gap" between University and Industry due to a lack of communication. In the best case, academic people establish their own companies to promote the development of their discoveries. At Defense level, as soon as DRME was established in 1960 to become later DRET, this deficiency was realized and a mixed structure organized. It is made up of research groups including engineers, military and academic people, the information flow being channeled by different acting bodies such as CEDOCAR, the research groups of DRET, the industry, the Staffs and the University.

For the same reasons as for documentary organization, there is no self-contained structure for Defense/Aerospace coordination in terms of research and development. This results mainly from the wide variety of the fields concerned. However, through DRET organization, we can perceive the importance of this sector and the various services and agencies which participate in it. The R.D.E. concept covers all operations, from operational research to prototype development. But in the particular case of the aerospace sector, starting the development of an application or equipment is a decision which has considerable financial, industrial and operational impacts.

The analysis of information flows between the parties concerned shows clearly a coordinated organization based on the very structures of the agencies envolved and on the organization of the current utilization of documents. A system has thus been devised, in which the mechanisms or acting bodies are the various services concerned. However, the acting bodies must play the game. For that purpose, they must be helped through information and education on pain of ending in what Michel CROZIER and Erhard FRIEDBERG would call a "non-organization"(6).

B) RESEARCH COORDINATION (7)

Within DRET, the Defense research and study organization tooks as a pattern in its methodology the "Theory of Systems" developed in the 60's and this led to the setting up of a Defense Research Monitoring and Scientific Management structure. This pattern provides for the collection of information based on ideas, projects, research results and budgetary elements with a view to an automated management of this data, the preparation of syntheses intended to trace it back to deciders and, in some instances, to the Minister of Defense.

A clear discrimination was made between "agreed developments" and upstream research and study operations prior to such developments.

Agreed developments are dealt with individually on the Minister's decision, after a technical operational and financial study, in coordination with the Staffs, and the Ministry Directorates and Departments.

Upstream research is performed through specific procedures aiming at :

- diversifying contracting agencies,
- concentrating and coordinating the Ministry departments responsible for the guidance and programming of studies.

The agencies in charge of the studies are :

- DGA Establishments, Laboratories and Technical Centers
- University Establishments
- Private Companies : MATRA, SNIAS, SNECMA, DASSAULT
- National agencies such as CNES (Centre National d'Etudes Spatiales : National Center for Space Studies)
- Research agencies under DRET's tutelage such as ONERA (Office National d'Etudes et de Recherches Aérospatiales : National Office of Aerospace Studies and Research) and ISL (Institut Franco-Allemand de Saint-Louis : Franco-German Institute of Saint-Louis).

Through these agencies, DRET has thus at hand adequate means enabling it to act directly upon design programming up to equipment production. With ONERA, it participates preponderantly in the Aerospace sector activities, bringing its contribution to the studies and work of CNES, DGAC (Direction Générale de l'Aviation Civile : Civil Aviation General Directorate) Technical Directorates of DGA (mainly DTEN (Direction Technique des Engins : Missile Technical Directorate) and DTCA (Direction Technique des Constructions Aéronautiques : Aircraft Manufacture Technical Directorate). Owing to its links with universities and industry, ONERA ensures the transfer of information and technologies to the programs in progress with the manufacturers of aerospace equipment for civil or military use.

Thanks to ISL, DRET is supported by a research agency equipped with substantial resources for ballistic studies (target range, wind tunnel, etc.).

Upstream studies are coordinated through guidance and programming agencies whose task is to provide for a tight concerting among the agencies concerned so as to achieve a permanent comparison between military requirements and scientific and technical potentialities. These are :

- CRED ("Conseil de Recherche et Etudes de Défense" : Defense Research and Study Council)
- GROUPS ("Groupe de Plannification et d'Etudes Stratégiques" : Strategic Planning and Study Group)
- The Scientific Adviser to the Minister
- DRET ("Direction des Recherches Etudes et Techniques" : Research, Study and Technique Directorate) entrusted with the following missions :
  - coordination and performance of research and studies, either within Defense or through contracts signed outside Defense ;
  - technical coordination of fields common to several directorates ;
  - coordination of upstream research and study programs.

For the latter missions, DRET is backed up by GTPI ("Groupe de Travail Permanent Interdirection" : Interdirection Standing Working Group).

In addition, DRET monitors a number of scientific and technical fields likely to know developments leading to interesting applications for Defense, in the short or long term.

The relationships which develop between research structures (research department) and documentary structures (CEDOCAR) play a key role in the transfer of information. Equipped with a documentary cell with interrogation specialists, DRET systematically receives a substantial volume of information in the form of primary or secondary documents and, through CEDOCAR has access to the various data banks useful to it. The information so obtained makes it possible to up-date the various scientific files on the one hand, and to meet the requests for bibliographic research made by DRET engineers, on the other hand.

As soon as a new axis of research has been selected, various courses of action may be adopted :

- to make up data cards and distribute them to all DRET departments interested in them ;
- to perform complementary bibliographic research so as to have a better understanding of the subject and an account of the studies in progress in France or abroad ;
- to make up a file on the subject and distribute it when its size becomes critical ;
- to prepare a record sheet ;
- to prepare a report for internal use ;
- to prepare a finalized report through an expert specialized in the specific field ;
- to enter into a contract with a university or other scientific team deemed to be qualified in the matter.

Meetings are arranged by DRET, in order to obtain a better symbiosis between the various groups of Research Department, Industries, Universities and Technical Directorates and facilitate the possible transfer of such studies at the end of research for further development.

Generally speaking, every work contributing to a clear understanding of the national and international situation in the most varied scientific and technical fields contributes to provide programmers with arbitration arguments on the choices to be made in view of an available budget which is never extendible at will.

C) RESEARCH PLANNING

The research and study planning and programming system launches operations scheduled for three years, planning being based on :

- operational information originating from the Staffs
- scientific and technical information originating from DGA
- scientific information originating from prospective surveys conducted as part of VST ("Veille Scientifique et Technique" : Scientific and Technical Monitoring).

The planning and Strategic Study Group prepares basic research objectives which make up the DMO ("Direction Ministérielle d'Orientation" : Ministerial Directorate for Guidance).

Once scheduled, all the upstream research and studies are programmed within the framework of two programs :

- the PPRE ("Programme Pluriannuel des Recherches et Etudes" : Multiannual Research and Study Program)
- the PPDE ("Programme Pluriannuel des Développements Exploratoires" : Multiannual Exploratory Development Program).

Resting on DMO, the PPRE defines each operation in the form of research and study sheets, in both its technical and financial aspects.

The PPDE is prepared under better conditions than the PPRE but it includes an additional financial survey on the responsibility of the DPAI ("Direction des Programmes et Affaires Industrielles" : Industrial Affair Program Directorate) which submits the project to CRED and to the Minister.

D) RESEARCH MANAGEMENT

Implemented by DRET, the research and study planning rests also on an automated data bank which is used by the various research groups for the organization of long term research and study programs and for the financial and adminstrative management of the various contracts. This bank, which records the reference of each contract, the holder's name, the financial elements, etc., is a real decision making aid in terms of research coordination.

The use of DRET's coordinating system enables the engineers in charge of research groups to follow up a research from design up to the applications which materialize in the industry. Such is the case; for instance, of Carbon-Carbon materials studied under DRET contract by SEP ("Société Européenne de Propulsion" : European Propulsion Company), developed by DTEN ("Direction Technique des Engins" : Missile Technical Directorate), the application transfer to the medical sector of which is in progress for hip prothesis production.

Another example, which involves both the Research Sector and documentary structures, shows that the benefits drawn are often rather remote from the application which was meant to be supported and developed.

Thus, on the spur of DRET, based on a data bank relating to the human body measurement recording, a real concept aid system has been worked out, the development and achievement of which have been entrusted to the Anthropology and Human Ecology Laboratory of Paris Medicine Faculty. This data bank is used for studying the habitability of air or ground vehicle cabins.

The planning system utilized by DRET is also used for determining the cost of operations to be carried out and control in real time the expenditures associated with each program, the Aerospace/Missile sector representing nearly 40 % of the RDE budget.

CONCLUSION

The coordinated "Information-Research-Industry" complex rests on a "Defense" basic structure of which the aerospace sector is a sub-unit. The participating agencies belong to the state-controlled sector (CEDOCAR, DRET, Universities) and to the para-state-controlled sector (National Companies). However, an unequal task sharing is observed.

In the organization of information, the State plays an essential centralizing role for the collection and coordination of documentary product distribution, while the private sector acts only as a contributor and user of the systems.

On the other hand, the distribution of Research and Development activities seems better determined, as the Administration insures research financing and the private sector military and civil developments.

As regards theories of system organization and analysis, in the so obtained unit we can find the conventional synoptic pattern of a priori organization (research management) associated with an a-posteriori coordination pattern (information coordinated structure).

While favoring information and technology transfers, this structure complementarity yields substantial benefits for Defense and the Aerospace sector resulting from :

- an improved management of open and protected information,
- the coordination of efforts and resources,
- the follow-up of RDE activities through the agencies concerned.

BIBLIOGRAPHY

(1) GINA KOLATA - Technology transfer : New Control Urged
Science vol.215 - February 1982 - pages 635-636.

(2) A. YANEZ - Non Technical factors which will have an influence on information systems. AGARD Conference pre-print n° 204 - August 1981.

(3) D.U. WILDE - Maximizing user benefit from Technical Information Center.
AGARD Conference pre-print n° 1979 - September 1975.

(4) P. WIKERS
Alan GILCHRIST - Patterns of information transfer storage and retrieval in various types of organization. Proceedings of ASLIB Conference - 6-8 April 1981.

(5) - Space benefit - The secondary application of aerospace technology in other sectors of economy - NASA N-29060 - 174 p.

(6) M. CROZIER - The Actor and the System - SEUIL Publications.

(7) - Defense Research - Scientific and Technical Monitoring
(not published - DRET 1981).

BENEFITS TO UNIVERSITIES OF A COORDINATED INFORMATION STRUCTURE

Randi A. Gjersvik
Head of Public Services
University of Trondheim
Norwegian Institute of Technology
The Library
N-7034 Trondheim-NTH
Norway

The university's role as a user and producer of documented knowledge is outlined. Literature retrieval is necessary in study and research, and the importance of education in the literature searching techniques is emphasized. The role of the university library and its resources in the information structure is discussed. The benefits to the students and the academic staff of an effective and simple information retrieval structure is stressed.

THE UNIVERSITY - A USER AND PRODUCER OF KNOWLEDGE

Universities have a dual role. They shall: 1) Give the students the highest education within the curriculum taught, and 2) conduct research within the same subjects. At the universities that teach engineering and applied sciences, this research is often of a practical nature and directed towards industrial application of the research results. I want to concentrate on the universities which teach such subjects, because it is from this kind of universities Defence/Aerospace Information mostly is requested. It is graduates from these universities who will enter into future productivity, and who therefore must learn to exploit the available information.

The education of students is based on acquired knowledge. This knowledge is, through research, constantly updated and developed. In the environment of many technical and other universities we find major independent research and development organizations. This results in an interaction between student education and the research and development which is ongoing in our society. The sum of human knowledge today is so vast that it is impossible for a single human being to possess all knowledge, even within a single subject field. The students are through their education made familiar with the field of science they are studying and with the scientific methodology.

The sciences are rapidly developed. It is often a waste of study time to memorize a lot of data and details which easily can be looked up in the literature. It is far more important that the students are taught how they shall seek information within their field of study. This knowledge about information retrieval should be used both during the study years and later when they have graduated. Primarily, I am referring to retrieval of written information.

EDUCATION IN LITERATURE RETRIEVAL

Unfortunately, documentation and information retrieval have till now not been given sufficient importance in our technical universities. Information retrieval courses are today being arranged for higher level students at most technical universities I know. These courses are of varying duration. I think, however, that students who are motivated for education within this field, will be able to acquire the necessary guidance. The responsibility for this is usually placed with the university libraries. The motivation for the student to seek education in information retrieval methods must be given him from the faculties of his main subject studies. This may be accomplished by demanding separately reported literature searches in connection with major papers, diploma work etc.

We who are engaged in information work, preach that every single research of development project should start with a thorough research of literature. This must be learned during the studies for later to be practiced in work life. One obvious benefit in this is the avoidance of duplicate research.

Information user education has gradually grown into a common international subject field. Learning programmes are developed for the use of various abstract journals and for information seeking within different fields of subjects. These may be tape/slide programmes, video programmes or text books. Some of these are developed locally, others may be produced by the information supplier. On a Scandinavian basis a survey over existing material of this kind from the various university and research libraries has been compiled, in order to enhance the quality of user education.

LITERATURE RETRIEVAL AIDS AND TECHNIQUES

A literature research should ideally cover all published material relevant to the research subject. The present enormous production of literature makes this an impossible task. However, thanks to edp and comprehensive international abstracts and indexes we have very effective aids, and they are constantly being improved.

An abstract or an index journal contains references to, and often a short resumé of, published literature like journal articles, reports, patents and monographies. They are normally indexed in several ways, thus making it possible to search for the literature by subject, by author, by chemical formula or by other criteria. Edp has opened the possibility to still more effective ways of searching and acquiring literature. The abstract journals may be restricted to one scientific field, as "Chemical Abstracts", or cover all subjects within a limited publication field, like for instance "Government Reports Announcements and Index".

The abstract journals are constantly expanding their coverage of literature, and the searching possibilities are being improved by more indexes, free-text searching etc. A growing international cooperation and vastly improved international telecommunication networks have made the collection and storing of abstracts information in great data banks readily accessible for online searching. Often this will offer more searching possibilities than the printed editions of the abstracts, and the searches will give a swifter reply.

THE UNIVERSITY LIBRARY'S PLACE IN THE INFORMATION STRUCTURE

At all universities there is a university library with people professionally trained in information retrieval and documentation. There you will find printed editions of the major journal abstracts, citation indexes etc., and here you will also find catalogues of library collections as card files or on microfiche. Usually you will also find access to online searches against the international and national databases. A university library, however, does not only have this kind of literature, which we normally refer to as secondary literature. You will, of course, also find extensive collections of primary literature which consists of journals, monographies, report series, patents, standards, textbooks etc. It is in this literature, and not in the references to it, that the information user finds the text he really is looking for. It is this primary literature the literature search shall lead to as the final result. Indicated literature which is not found in a given university library's collections may be acquired through international connections, for instance from other university libraries, research institutions, information centres etc.

When I maintain that the academic staff and the students within a university have the possibilities to utilize a versatile and coordinated structure, I refer to the possibilities that they have for both the national and the international information structure with all its services and aids. They also have the local expertice and collections of literature, both primary and secondary, in the university libraries. It is often just these local services which constitute the link between the literature user in the universities, and the international information structure.

In order to expand on the theme of how primary literature is obtained to the users, I would like to give some numbers from my own library at The Norwegian Institute of Technology (NTH). I must add that this library also functions as a technical central library for Norway, and is the only library with extensive collections of technical literature in the magnitude of 800 000 volumes books and journals and about 10 000 current periodicals. It services therefore not only NTH, but also Norwegian industry and research and development institutions.

Of the 46 000 inquiries arriving at the external loan office of our library during 1981 we filled 70% from our own collections. These were mainly requests for copies of articles, reports, patents etc. 10% were acquired from the British Library, Lending Division, and 12% from other countries, mainly from the Scandinavian countries, West Germany and USA. We have also acquired literature from more remote countries such as Japan and Russia. About 2% of the inquiries could not be answered because of incomplete bibliographic information. Within this number lies also some of the "grey" literature which is lost to the general public because the authors have no thought for the possibility of later retrieval. One example is conferences with a secretariat without a permanent address. Military reports belong to another difficult field, for obvious reasons. The remaining 6% concern requests from institutions outside NTH which wish to carry on the further investigations themselves.

ACCESS TO GOVERNMENT LITERATURE

It may be of interest to delve a bit deeper into how university libraries acquire government literature. Again, I refer to my experiences from the library at NTH. The report series that the library subscribes to regularly, are ordered directly from the institutions which publish them. We subscribe to all official reports in the technical diciplins on microfiche since 1974 from the National Technical Information Service in USA (NTIS). Unfortunately, economical considerations have forced us to drop this subscription as of this year. We will now have to get the reports required from England. This is a more expensive and time consuming solution for our users. Of course we subscribe to the abstract journal "Government Reports Announcements and Index" (GRA), which makes it possible to locate the relevant reports.

In the NTIS database and in GRA we also find information about and references to a number of official reports which have not originated in USA. This is a very useful feature for us. Interest has also been expressed for reports from research bodies at NTH to be referred in NTIS. An offer about this from NTIS has recently been accepted.

Correspondingly we receive the monthly "Catalogue of Government Publications" from Her Majesty's Stationary Office in Great Britain. The official information agencies of the various countries are valuable contacts. Because the NTIS covers such a large field of report literature, it gives good prospect for the search to meet with success. This is, of course, highly appreciated. A coordination of national official reports greatly helps the information searchers. I mentioned earlier that it may be difficult to acquire military reports, even if they are unclassified. We have quite a number of requests for such reports, mainly for American ones. Usually we apply directly to the military institution which has published the report, and unless the report is restricted, we will get it. When we get a request for a military report, it is often a problem to verify whether the report is classified or not. We therefore may be lead to request classified materials, though of course we try to avoid this. Scandoc, which is a Scandinavian office for information retrieval in USA, presents another possibility, but this is a rather expensive one.

Patent literature is acquired through the Norwegian Patent Office and standards from the Norwegian Bureau of Standards. We also subscribe to a number of standards and patents ourselves, for instance all US patents, which we get on microfilm. Another method to acquire the literature of other countries is by the exchange of literature.

BENEFITS TO STUDENTS AND THE ACADEMIC STAFF

In conclusion I should like to sum up the benefits to students and researchers of being familiar with a coordinated information structure, as I have defined it.

For the students:

- A useful methodology which will be a valuable tool in their future work, and which will increase the productivity and development in the institution where they will be employed.
- As students they will be able to make their literature searches effective during their studies, and thus improve on the preparation of their papers and diploma works.
- Through literature searches they will learn how papers and reports should be published in order to be retrieved. Relevant titles and resumés and publishing in journals and report series which are abstracted and indexed are important, likewise the use of a language which is widely understood.

For the university's academic staff and searchers:

- Through regular literature searches they will keep themselves ajour with developments within their subject fields.
- This will spur the establishing of contact with research environments which have common interests.
- Reading of resumés or the works of other authors may lead to creativity.
- Economizing with resources in avoiding duplicate research or development.
- Research bodies will be able to build on other reports and gain quicker and better results.

It is not possible to mention here all of the possibilities the university library has for the acquisition of literature for its users. I maintain however, that with proper use of the university library, students and researchers can today acquire all the literature they wish, unless it is restricted by the publisher or the author. There are, however, two conditions for success. The first is that the literature is reviewed in the international abstract journals, book indexes or similar works thus making it possible to localize the information. The second is that it is possible to use these tools, either by searching oneself, or by using the expertise at the university library.

As a user of information systems and a teacher in information methodology I am looking forward to, and hoping for, even more improved aids in information searches: greater databases and abstract journals, better coverage in all fields of subjects, standardized and simple search systems, less expensive online search services and a quicker and cheaper availability of primary literature to students and researchers.

These user groups must again be further motivated to take a full benefit from the possibilities for search and retrieval of information given them through coordinated information systems.

REFERENCES

(1) International loan services and union catalogues: a manual. - 2nd completely rev.ed. - Frankfurt am Main, c1980. - 294s. - (Zeitschrift für Bibliothekswesen und Bibliographie. Sonderheft; 17). - ISBN:3465014278.

(2) Lamvik, Aud. What should users expect from information storage and retrieval systems of the 1980's. AGARD. Paper reprinted from conference proceedings no. 304. 1981. 5p.

(3) Riksbibliotektjenesten. Fjernlånsutvalget. Fjernlånsamarbeidet: Praksis og problemer: innstilling. Del 1. - Oslo, 1980 - 61p. - (skrifter fra Riksbibliotektjenesten; 18)

(4) Riksbibliotektjenesten. Fjernlånsutvalget. Fjernlånsamarbeidet: Prinsipper og anbefalinger: innstilling. Del 2. - Oslo 1981. - 107p. - (skrifter fra Riksbibliotektjenesten; 19)

COMPARAISON DE RESEAUX D'ACCES AU DOCUMENT : les schémas décentralisé, semi-centralisé et centralisé.

par le Commandant Jean-Fr. MULLER
Directeur adjoint
de la Bibliothèque Centrale
et du Centre de Documentation
du Ministère de la Défense Nationale belge
Quartier Reine Elisabeth
1140 EVERE (BRUXELLES)

Par une étude de cas, particulièrement le coût des livres et périodiques ainsi que des activités propres aux bibliothèques, en vue d'acquérir, de conserver et de communiquer les documents, l'auteur démontre la nécessité, non seulement d'automatiser les bibliothèques, mais surtout d'établir une liaison entre elles.

Cette liaison peut s'établir selon trois schémas : décentralisé, semi-centralisé et centralisé. Les caractéristiques de ces réseaux d'accès au document sont analysées pour établir la balance de leurs avantages et inconvénients respectifs.

* * *

Par leur aptitude théorique à rencontrer les besoins d'information, les bibliothèques sont l'outil le plus adéquat mis à la disposition des lecteurs et chercheurs.

Mais présenter aujourd'hui, demain et au cours des siècles prochains, toute la documentation mise sur le marché aujourd'hui ou au cours des siècles passés, c'est devenu pour elles une mission particulièrement complexe, alors qu'elles l'avaient, jusqu'ici, remplie à la satisfaction générale.

Il se fait qu'actuellement, en effet, ces vénérables institutions sont submergées de propositions qui dépassent, ô combien, leurs possibilités financières, sinon d'espace. C'est bien connu, - et la crise économique que nous traversons n'arrange rien - la prolifération documentaire est telle qu'aucune bibliothèque, fût-elle mondiale, n'a pu, ne peut et ne pourra acquérir toute la production en cette matière.

Quand Gutenberg a supprimé des emplois de bénédictins en introduisant l'imprimerie, sans doute n'en mesurait-il pas les conséquences...

A notre époque de rénovation super-intellectuelle, où le diplôme universitaire a acquis la valeur relative du certificat d'études secondaires de jadis, il ne manque pas d'auteurs pour écrire de multiples ouvrages sur chaque détail de notre vie politique, scientifique ou sexuelle.
Il n'en manque point non plus pour compiler cette littérature et la reproduire avec d'autres mots. Les circuits commerciaux en regorgent au point de devoir détruire les livres si la vente ne suit pas, afin de résorber les coûts du stockage.
Il en résulte que, malgré un fort tirage éventuel, le document est rapidement introuvable ; sans compter la littérature qui n'apparaît pas au grand jour, cette littérature dite grise ou sous-terraine, très spécialisée, n'intéressant qu'un public très restreint, imprimée à faible tirage et généralement fort onéreuse si elle est prise en charge par un éditeur.

Pourtant, l'information ne peut être perdue ; il faut en assurer la pérennité. Si on n'utilise plus le fusil à silex ni l'avion de chasse à hélice, on lit encore les lettres de St.Paul aux Corinthiens avec le même intérêt pour les uns que les lettres de Napoléon à Joséphine pour les autres.

C'est dire que la certitude de pouvoir répondre en tous temps aux demandes les plus diverses des lecteurs, implique l'achat de tout ce qui s'imprime, dans son pays comme ailleurs, ce qui est, faut-il le dire, une vue de l'esprit.
Un pas a pourtant été fait dans ce sens par l'instauration du "dépôt légal" dans la plupart des pays, ce qui oblige les éditeurs à mettre un exemplaire au moins de leur produit à la conservation éternelle... Hélas, ceci ne couvre pas toute la production, tant s'en faut. Les documents les plus rares y échappent généralement, par le seul fait qu'ils ne sont pas produits dans la chaîne normale de production, de distribution et de consommation.

Néanmoins, comme le constate Marc Chauveinc, les bibliothèques sont toujours dépendantes d'un organisme de tutelle : municipalité, université, entreprise, département ministériel, etc. Il en découle une certaine forme de spécialisation et même d'autosuffisance, dans la seule satisfaction des besoins bien circonscrits d'un public réduit.

Pourquoi, dès lors, ne pas en rester là ? Pourquoi ne point se satisfaire d'un système qui jusqu'ici a donné un rendement convenable ?

Tout simplement parce que, chaque jour, le bibliothécaire tente de résoudre la quadrature de ce cercle infernal : avec un budget en régression, couvrir le maximum de besoins dans un marché en ébulition où les coûts sont en hausse exponentielle, à l'image de la production.

Une étude sommaire, réalisée par mes collaborateurs sur les acquisitions et abonnements de la Bibliothèque Centrale du Ministère de la Défense Nationale belge, m'a permis d'établir que le prix moyen payé en 1982 pour 100 pages d'un livre se monte à ± 6 $. 100 pages d'articles de périodiques banalisés reviennent à ± 2,50 $. S'ils sont scientifiques ou techniques, les articles reviennent à ± 4,50 $ les 100 pages.

L'évolution des prix au cours des dernières années sème la panique. Les tableaux ci-dessous sont significatifs d'une tendance à l'inaccessibilité du document dans des normes budgétaires raisonnables (Tab 1 et 2).

Tab 1. Prix moyens des livres payés par la Bibliothèque Centrale du MDN.

Pays	Langue	Prix moyen en FB calculé sur base de 150 livres par langue				
		1978	1979	1980	1981	1982
Belgique & France	Français			648	1035	837
Belgique & Pays-Bas	Néerlandais			517	664	499
RF Allemagne	Allemand			815	967	952
Grande-Bretagne & Etats-Unis	Anglais			1176	1016	1880
Prix moyen global(600 livres)		562	702	789	920	1042

Remarques
1. Le prix moyen des livres a été établi sur base de 600 livres par année, répartis en 4 langues et pris au hasard dans les registres d'entrées de la bibliothèque.
2. 100 FB = ± 2 $.
3. La présence d'ouvrage très spécialisés ou encyclopédiques dans l'échantillon peut influencer le coût moyen de façon très sensible. C'est ce qui explique les baisses apparentes par pays, en contradiction avec la tendance globale à la hausse.
4. La majorité des livres en allemand traitent d'histoire militaire et de technique.
5. Les livres en français sont souvent en co-édition franco-belge.
   Les livres en néerlandais sont souvent en co-édition belgo-néerlandaise.
   Les livres en anglais sont souvent en co-édition anglo-américaine.

Tab 2. Evolution du prix des abonnements payés par la Bibliothèque Centrale du MDN.

Pays	1978	1980		1982		Prix moyen en FB de 100 pages(1982)	
						de la revue Pub comprise	d'articles sans Pub
Belgique (171)	100	118	+ 18 %	144	+ 22 %	82 (26)	94
France (154)	100	126	+ 26 %	166	+ 32 %	111 (27)	114
Pays-Bas (34)	100	120	+ 20 %	168	+ 40 %	59 (5)	75
RF Allemagne (33)	100	120	+ 20 %	152	+ 27 %	157 (6)	189
Grande-Bretagne (46)	100	129	+ 29 %	209	+ 62 %	111 (10)	166
Etats-Unis (115)	100	108	+ 08 %	189	+ 74 %	121 (15)	185
Taux d'augmentation global	100	120	+ 20 %	171	+ 40 %	105 (89)	142

Remarque : Les chiffres entre panrenthèses indiquent le nombre de périodiques qui ont été analysés.

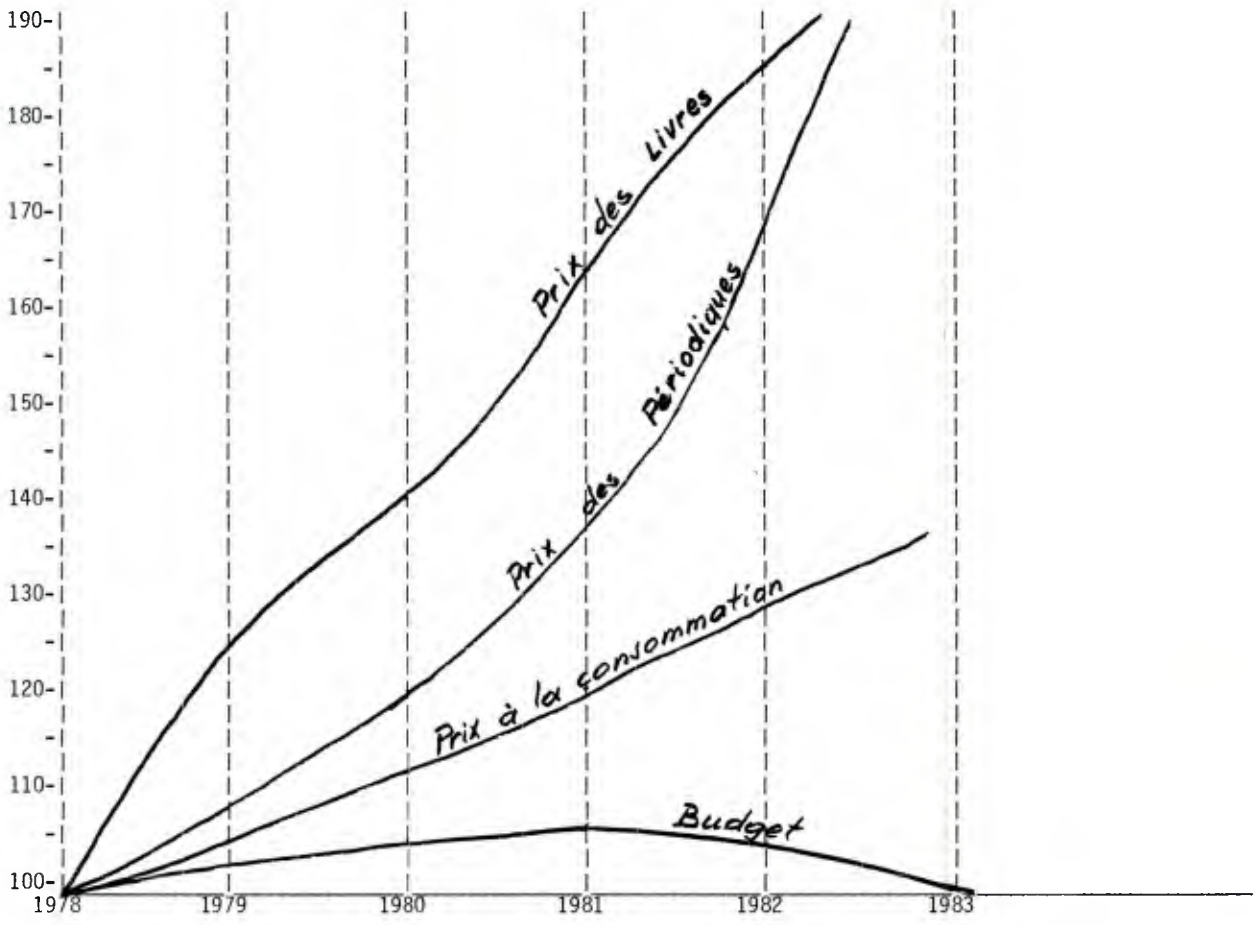
L'évolution des budgets, on s'en doute, est en raison inverse (Tab 3).

Tab 3. Evolution du budget de la Bibliothèque Centrale du MDN comparée à l'évolution du prix moyen des livres et de l'indice des prix à la consommation. (Le prix moyen des livres a été établi comme indiqué au Tab 1. Tous les indices ont été ramenés à une base 100)

Années	1978	1979	1980	1981	1982	1983
Budget (1978=100)	100	102,25	104,35	106,45	104,45	101,60
Taux de croissance	----	+ 2,25 %	+ 2,05 %	+ 2 %	- 1,9 %	- 2,75 %
Prix moyens des livres	100	125	140	164	185	207
Taux d'augmentation	----	+ 25 %	+ 12,5 %	+ 16,5 %	+ 13 % (?)	+ 12 % (?)
Indice des prix à la consommation	100	104,5	111,5	120	128 (?)	137 (?)
Taux d'inflation	----	+ 4,5 %	+ 6,5 %	+ 7,5 %	+ 6,5 %	+ 7 %

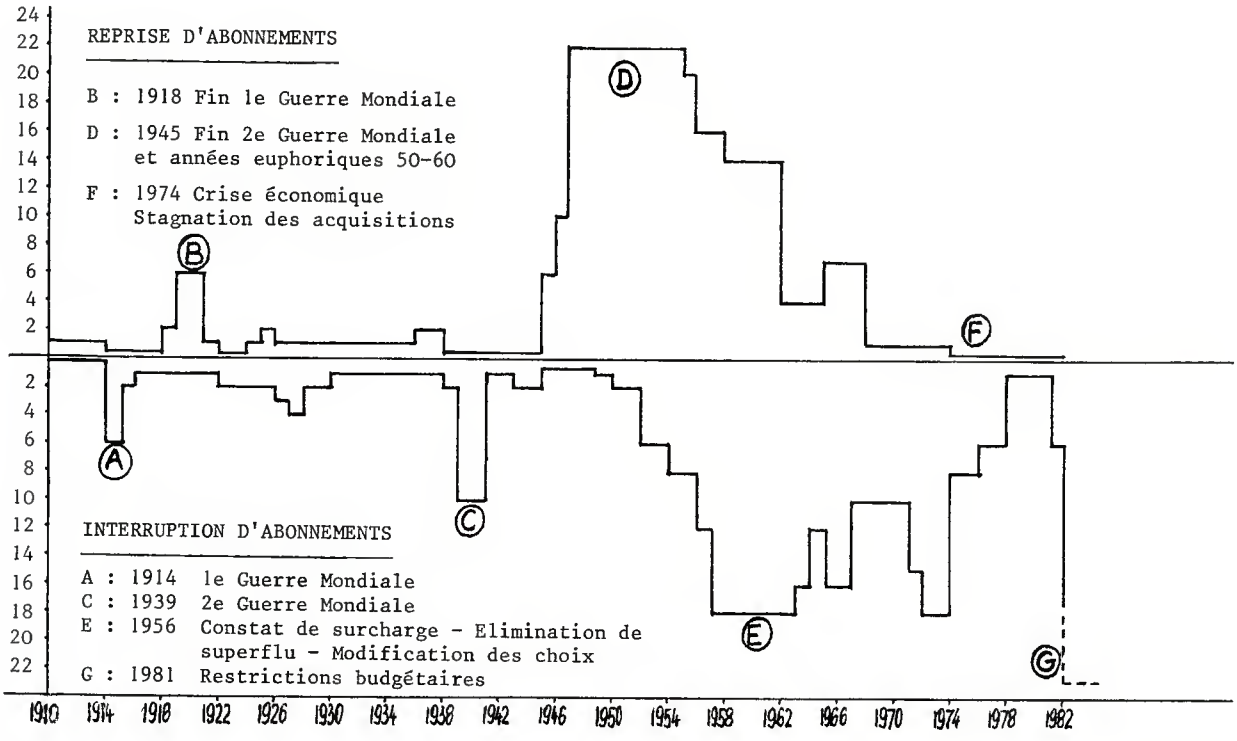
La comparaison reportée sur graphique est édifiante (Tab 4).

Tab 4. Evolution comparée du budget de la Bibliothèque Centrale du MDN, du prix moyen des livres et périodiques et de l'indice des prix à la consommation.



Sans vouloir tirer de conclusions rigoureuses de cette étude sur échantillons, on peut dire avec certitude que cette situation que l'on retrouve dans la majorité des bibliothèques, ne s'améliorera pas de si tôt. Il y aura donc une poussée généralisée de restrictions dans les acquisitions, ce qui entraînera inexorablement une certaine incohérence et de nombreuses lacunes dans la constitution des fonds de bibliothèques. Mais ceci est cyclique et propre aux années difficiles de crises économiques et de conflits. C'est ainsi que des collections enrichies avec amour au fil des ans, se voient brusquement interrompues. Des ouvrages laissés pour compte par économie seront peut-être un jour introuvables parce que les bibliothèques auront fait le même choix dans leurs restrictions.

Le tableau suivant indique l'état des collections les plus marquantes, à ce point de vue, à la Bibliothèque Centrale du MDN belge (Tab 5), où plus de 100 abonnements doivent être interrompus cette année. La Bibliothèque Nationale française a renoncé cette année à 380 abonnements étrangers alors qu'elle s'écroule sous le monceau de périodiques français non payants qui lui sont envoyés en dépôt légal (6 à 7000 fascicules par semaine).



La conclusion générale que l'on peut tirer de ces douloureuses constatations est paradoxale. Alors que la production n'a jamais été aussi florissante, au point de faire déborder le dépôt légal (qui ne prête pas) les bibliothèques achètent de moins en moins et il sera de plus en plus difficile pour le lecteur, de trouver "le" document qui lui convient.

* * *

Si je me suis appesanti sur ces quelques données statistiques, c'est pour introduire la réponse à la question fondamentale suivante : les bibliothèques peuvent-elles continuer de fonctionner isolément ?

La réponse est claire : NON. Non, sous peine de frustrer doublement le lecteur, sinon l'organisme de tutelle tout entier. Une première frustration par le fait que sa bibliothèque habituelle n'aura pu fournir le document espéré ; une deuxième frustration parce que cette même bibliothèque n'aura pu guider le lecteur dans sa recherche, par la localisation du document dans l'une ou l'autre bibliothèque voisine.

Il faudra que, d'une manière ou de l'autre, une liaison s'établisse entre les bibliothèques pour qu'un service mutuel augmente les chances de satisfaire le chercheur, soit par la fourniture immédiate du document, soit par la fourniture différée par prêt interbibliothèques, soit aussi par la localisation de l'information dans le réseau établi.

Quelle forme prendra cette liaison, ce réseau d'accès au document ?
L'UNESCO la détermine sous trois schémas possibles : décentralisé, semi-centralisé ou centralisé. Une définition très sommaire pourrait être respectivement : liberté anarchique, liberté dirigée ou liberté rationnelle d'acquisition, de conservation et de mise en communication des documents.

Mais avant de pousser plus avant l'analyse, je voudrais presqu'ériger en postulat l'impérieuse nécessité pour toute bibliothèque digne de ce nom, de s'informatiser. Les auteurs s'accordent sur la proposition et il n'est pas nécessaire de rappeler ici les études qui mènent à cet accord. Il est cependant bon de rappeler, pour mieux s'imprégner des différentes activités élémentaires du bibliothécaire, les quelques fonctions principales que l'on retrouve à chaque acquisition d'ouvrage et dont le coût en personnel, en temps et en matières intervient dans l'analyse du réseau informatique à mettre en place comme de celui de l'accès au document.

Dans sa routine journalière, le bibliothécaire examine l'ample documentation bibliographique qui lui parvient par différents canaux. Loin d'être exhaustive, cette documentation lui fournit matière à réflexion et à sélection, pour le choix des ouvrages qu'il va commander. Il ira compulser les catalogues et les commandes en cours pour s'assurer que les titres retenus n'existent pas déjà en rayon ou n'ont pas déjà été commandés.

Les propositions d'achat ainsi expurgées et la commande une fois établie, celle-ci est lancée dans la chaîne commerciale et un fichier provisoire est constitué.

A la réception de l'ouvrage, le bibliothécaire retourne à son fichier provisoire, enregistre le livre, établit des fiches de différents types pour en arriver à présenter au lecteur un catalogue le plus complet possible, où l'ouvrage pourra être retrouvé sous son titre, son auteur, sa collection, sa classification décimale, ses descripteurs, etc. Idéalement, on le retrouvera aussi sous forme de résumé.

Le livre est enfin étiqueté, plastifié ou relié, pour passer dans les rayons, à l'usage des lecteurs.

Toutes ces activités que l'on pourrait décomposer en activités élémentaires dont il serait fastidieux de faire ici l'inventaire, s'exécutent dans une chaîne de traitement où défilent les piles de livres reçus journellement.

Toute bibliothèque qui travaille isolément est astreinte à une série minimale de ces traitements. Il est intéressant d'établir les temps moyens obligatoirement consacrés à chaque livre, pour les deux modes de traitement, manuel et automatisé. (Tab 6)

Tab 6. Temps moyens de traitement d'acquisition d'un ou plusieurs exemplaires d'un même titre, le même jour ou à dates éloignées, par une ou plusieurs bibliothèques en réseau manuel et en réseau informatisé. (Les temps sont exprimés en minutes).

Fonctions indispensables	TRAITEMENT MANUEL				TRAITEMENT INFORMATISE			
	Premier exemplaire		Exempl.suivants		Premier exemplaire		Exempl.suivants	
	Première biblioth.	Autres biblioth	Même date	Dates éloign.	Première biblioth.	Autres biblioth	Même date	Dates éloign.
Analyse technique de la proposition d'achat	1	1	-	1	1	1	-	1
Recherche des doublets	3	3	-	3	1	1	-	1
Commande	12 1/2	12 1/2	-	12 1/2	4	4	-	1
Réception et enregistrement	12 1/2	12 1/2	9	12 1/2	4	4	1	1
Catalographie	27	27	26	27	7	2	1	1
Indexation	34	34	5	14	23	3	-	-
Temps pour 1 livre (Min)	90'	90'	40'	70'	40'	15'	2'	5'
Temps pour 100 livres(Hr)	150 h	150 h	65 h	115 h	65 h	25 h	4 h	8 h
Total homme/jour pour 100 livres	20	20	8	15	8	3	1/2	1

On constate donc qu'une bibliothèque consacre aux seules fonctions reprises au tableau, 150 Hr au traitement manuel ou 65 Hr au traitement automatisé, pour une ration hebdomadaire moyenne de 100 livres. Cela signifie que, tenant compte des absences normales, 5 personnes au moins doivent y être affectées pendant 1 semaine de 5 jours dans le mode manuel, 2 personnes dans le mode automatisé.

Cela signifie aussi que trois bibliothèques qui achètent "Les tourments de la Lune" par Jean Soleil, consacrent chacune 1Hr30 (40 Min en traitement automatisé) à l'exécution des fonctions décrites. Si ces trois bibliothèques acquièrent 3 exemplaires du même titre, à des dates éloignées pour chacun des livres, le temps total sera de 3 X 90 Min + 3 X 70 Min + 3 X 70 Min = 11Hr30 en traitement manuel et 3 X 40 Min + 3 X 5 Min + 3 X 5 Min = 2Hr30 en traitement automatisé.

Par contre, s'il existe une base de données dans un réseau informatisé, une seule bibliothèque consacrera le temps maximum de 40 Min par titre, à la première acquisition. Les acquisitions ultérieures du même titre par cette bibliothèque ou par d'autres membres du réseau, n'impliqueront plus qu'un temps très court de traitement, à l'aide des données déjà enregistrées.
C'est cette base de données ou catalogue collectif qu'a réalisé notamment l'Ohio College Library Center qui, en créant un réseau de plus de 2000 bibliothèques actuellement, a singulièrement réduit le travail bibliothéconomique, tout en permettant aux bibliothécaires adhérents de connaîtreimmédiatement les acquisitions des voisins et de rationaliser les achats.

Le fonctionnement, automatisé et en réseau, améliore donc de façon remarquable le service au lecteur : rapidité, localisation du document, commande à distance éventuelle, sans préjuger des possibilités qui s'annoncent : télétexte, vidéotexte et autres gadgets informatiques que nous réservent les cerveaux électroniques et même humains.

Mais le lecteur n'a pas nécessairement le document en main pour autant. D'ailleurs, les connaissances du bibliothécaire se limite au catalogue collectif dont l'ampleur et la richesse sont fonctions de l'importance des bibliothèques qui le composent.

Or, les bibliothèques et tout leur fonctionnement, nous l'avons vu, n'ont de raison d'être, d'acquérir et de conserver les ouvrages, que pour les mettre en communication au lecteur dans les meilleurs délais. C'est donc cette dernière tâche qu'il me reste à examiner pour rechercher la solution adéquate au problème de la rareté de plus en plus sensible des publications en bibliothèque. Puisque l'on ne trouve plus chez soi, il faut chercher ailleurs.

* * *

Dans le schéma décentralisé, les bibliothèques existent pour elles-mêmes et leur public. Elles ne sont pas organisées en réseau contraignant. Elles restent libres de leurs acquisitions et de la mise en communication.

S'il ne peut satisfaire le lecteur dans toutes ses demandes, le bibliothécaire l'orientera éventuellement vers une bibliothèque spécialisée de ses connaissances ou vers l'une ou l'autre institution voisine dont il aura acquis, par ses bonnes relations, le catalogue le plus récent des accroissements. Peut-être, s'il est plus ou moins organisé et disponible pour cette transaction, le bibliothécaire demandera-t-il lui-même l'ouvrage, par un système aléatoire de prêt interbibliothèques de bon voisinage. La demande reviendra, satisfaite ou non, après être passée peut-être de bibliothèque en bibliothèque, suivant la bonne volonté de chacune à répondre à ces demandes extérieures, pour lesquelles elles ne sont pas organisées et qui risquent de frustrer leur propre clientèle.

Une étude réalisée par la Fondation universitaire anversoise (UIA) qui fonctionne dans un système de prêt à distance avec quelques bibliothèques belges et étrangères, à l'image de certains consortia américains, démontre que le temps de réponse moyen est de 23 jours. De façon assez compréhensible, les bibliothécaires s'adressent de préférence aux répondants les plus rapides, en l'occurrence la British Library Lending Division (BLLD), la Technische Hoge School de Delft ou la Faculté de médecine de Cologne.

Si l'affirmation de K. Van der Meer est vérifiée, selon laquelle une demande perdrait 3 % de sa valeur chaque jour après le troisième, elle serait caduque après 36 jours. Si l'on considère la durée moyenne des délais de transmission de 23 jours pour un ensemble de demandes dont la majorité est adressée aux institutions réputées les plus rapides, on peut conclure que les bibliothèques belges sont particulièrement lentes à répondre et que les demandes qui leur sont adressées tombent le plus souvent dans la caducité. Ces délais sont confirmés en Allemagne, j'en parlerai plus loin.

Comme rien n'est planifié : ni acquisitions, ni catalogues, ni service de prêt, les recherches sont longues et souvent infructueuses. Le taux de satisfaction des demandes est de l'ordre de 60 % pour celles qui n'auront pas été découragées en cours de route. La satisfaction en temps utile est de moins de 40 %.

Les catalogues collectifs, s'ils sont automatisés, facilitent et accélèrent la recherche ; mais ils ne sont pas exhaustifs et restent lourds ; ils ne sont jamais actuels s'ils sont manuels.

Plusieurs études américaines portant sur les coûts supportés par les bibliothèques prêteuses et emprunteuses démontraient, en 1978, que le prêt interbibliothèques revenait respectivement à 8 $ et à 10 $, soit près de 30 $ actuellement, soit aussi 1,5 fois le prix d'un livre.

Ce système anarchique débouche sur l'obligation pratique d'acquérir tout soi-même, ce qui n'est plus réalisable, ou de consentir d'énormes dépenses dans des essais aléatoires de prêt interbibliothèques, ce qui est d'autant moins réalisable.

Ainsi, les chances d'obtenir le document demandé, dans ce schéma décentralisé du réseau d'accès, sont une conjugaison d'aléas aux aboutissements peu fiables et très déconcertants pour le lecteur.

On pourrait en résumer comme suit les caractéristiques :

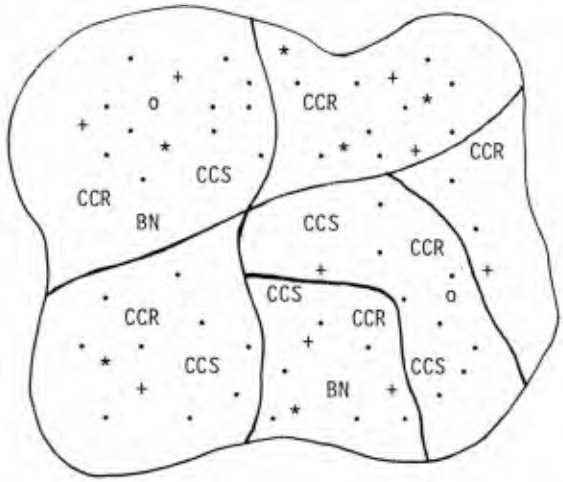
1. une politique anarchique d'acquisition qui entraîne de nombreuses lacunes dans la constitution globale des fonds de bibliothèques,
2. un système désorganisé, coûteux, lent et incertain de prêt interbibliothèques,
3. une orientation préférentielle des demandes vers les bibliothèques les plus diligentes, avec surcroît de travail pour celles-ci et danger de lassitude,
4. une préférence des bibliothécaires de satisfaire la demande locale par priorité sur la demande à distance,
5. l'avantage de ne point devoir investir dans tout autre système et de conserver sa liberté d'action, en dehors de toute contrainte, sauf...la demande du lecteur.

* * *

Le schéma semi-centralisé repose sur une organisation régionalisée du réseau des bibliothèques existantes, avec l'attribution à certaines d'entre elles de responsabilités particulières pour la constitution de collections spécialisées.

Ce schéma est d'application en République Fédérale d'Allemagne où les régions du réseau documentaire correspondent aux Länder.
Les Länder constituent chacun un catalogue collectif régional qui répertorie tous les titres acquis dans leur région.
Autour de ces collectifs régionaux gravitent les quelque 20.000 bibliothèques, bien entendu, mais aussi un assortiment d'autres catalogues collectifs spécialisés : Europe de l'Est, Armée, Presse, etc.

Parmi les bibliothèques universitaires, une petite centaine ont la mission particulière de constituer, à l'aide de subventions, des collections complètes dans des domaines précis et limités.
Quatre institutions spécialisées ont la charge de constituer des fonds exhaustifs dans les quatre domaines suivants : médecine, agriculture, sciences économiques, technique.
Il y a enfin deux bibliothèques nationales.



.	Bibliothèques publiques
+	Bibliothèques universitaires
*	Bibliothèques universitaires chargées de collections dans des domaines limités
o	Bibliothèques spécialisées
BN	Bibliothèques nationales
CCS	Catalogues collectifs spécialisés
CCR	Catalogues collectifs régionaux

Le fonctionnement est décentralisé régionalement. Ce n'est que lorsqu'on a épuisé les ressources régionales que l'on s'adresse à l'un ou l'autre des collectifs régionaux voisins ou aux bibliothèques spécialisées. Seules les demandes hautement spécialisées peuvent déroger à ce principe et être adressées directement aux bibliothèques spécialisées.

Ce schéma semi-centralisé présente des avantages et des inconvénients que l'on peut résumer comme suit :
1. Les catalogues collectifs manuels sont lourds, difficilement actualisés et coûteux. L'informatisation en cours nécessite des moyens assez considérables. Le coût de leur fusion et de la présentation sur microfiches était estimé à près de 1000 hommes/année en 1976 et à 25 millions de dollars.
2. L'absence de personnel spécialement affecté au prêt interbibliothèques, alors que l'on estime les besoins à 2,2 personnes par bibliothèque, est peu favorable au traitement diligent des demandes de prêt extérieures. Près de 50.000 personnes concernées en Allemagne.
3. La préférence subsiste de satisfaire la clientèle locale au détriment de la demande à distance, d'où une incertitude de satisfaction (65 % seulement des demandes satisfaites).
4. La majorité des demandes est orientée vers les bibliothèques les plus diligentes, d'où le risque de surcharge et de lassitude. Les autres demandes sont adressées au hasard et les temps de réponse et de satisfaction sont davantage aléatoires. Leur coût est élevé, de l'ordre de 15 $. Le temps moyen de réponse et de 23 jours.
5. Reposant sur le réseau de bibliothèques en place, le schéma semi-centralisé ne nécessite pas d'infrastructure nouvelle. Il impose cependant la confection de catalogues collectifs.
6. Un élément coercitif limite la liberté d'action de certaines bibliothèques par l'obligation d'acquérir des collections pour lesquelles elles n'éprouvent peut-être aucun intérêt. Ceci améliore cependant la couverture globale des publications, tout en limitant des duplications inutiles.

* * *

Le schéma centralisé repose sur un tout autre principe. Si l'on y conserve la part entièrement décentralisée du réseau des bibliothèques classiques, on crée toutefois un organisme nouveau, chargé exclusivement de répondre aux demandes de prêt à distance, un service central de prêt.

C'est le modèle britannique de la British Library Lending Division (B.L.L.D.) : une conception révolutionnaire du réseau d'accès au document. La B.L.L.D. répond à 10.000 demandes par jour, soit plus que toutes les bibliothèques de France et d'Allemagne réunies.

Contrairement aux bibliothèques classiques, qui se veulent gardiennes des documents rares et donc rarement utilisés, la B.L.L.D. acquiert, en première priorité, ce qui est le plus demandé, au besoin en plusieurs exemplaires, au risque de nombreuses duplications dans son propre fonds et dans les bibliothèques. Elle poursuit un seul but : fournir dans les délais les plus brefs, toute l'information demandée par les autres bibliothèques. Satisfaction est donnée par prêt de livres ou par envoi de photocopies d'articles.
La politique d'acquisition est basée sur la règle des 90 %, c'est-à-dire que l'effort porte sur les demandes les plus courantes. La B.L.L.D. constate que 98 % des demandes portent sur les titres de moins de 10 ans. La plus grande part des demandes se rapportant au périodiques ne portent que sur 2 ans. Les demandes rares ou difficiles, 10 %, sont traitées en seconde priorité mais avec le même souci de les satisfaire.

La B.L.L.D. joue aussi le rôle de centre national de stockage par la collecte des excédents de bibliothèques, à l'aide desquels elle reconstituent des collections pour les demandes ultérieures ou rares. A cette fin aussi, elle acquiert la littérature rare, sous-terraine, parce qu'elle ne sera trouvable dans aucune bibliothèque.

Si la B.L.L.D. ne peut donner satisfaction parce que le document est introuvable dans la chaîne commerciale, elle s'adresse à des bibliothèques de recours, sélectionnées parmi les plus grandes et les plus diligentes, toujours suivant la règle de 90 %, c'est-à-dire celles qui donnent le plus de résultats positifs pour le moindre travail.

La balance de ce schéma centralisé du réseau d'accès au document, penche fortement, on l'aura constaté, du côté avantages :

1. La demande non satisfaite localement peut être adressée sans plus de recherche à un seul organisme, toujours le même, spécialement organisé et structuré à cette fin et qui offre une quasi certitude (95% des demandes satisfaites) de fournir le document demandé, dans des temps records (50 % des 10.000 demandes journalières satisfaites le jour même) et à un prix défiant toute concurrence (+ 5 $ par transaction). Les bibliothèques peuvent néanmoins continuer de s'adresser aux autres bibliothèques, en toute liberté.
2. Les articles de périodiques sont photocopiés plutôt que prêtés ; ils restent donc disponibles en permanence d'où un amortissement plus rapide et peu de duplications superflues.
3. La B.L.L.D. est un véritable outil de rationalisation par sa faculté de stocker les excédents de bibliothèques, par l'analyse de l'offre et de la demande et sa souplesse d'adaptation aux besoins actualisés, par la concentration des moyens techniques puissants de reprographie, d'expédition, d'informatique documentaire, par la production de services annexes tels que traduction du russe, japonais, français, allemand, etc. ce qui augmente considérablement le potentiel documentaire aux moindres frais.
4. L'organisme de prêt centralisé n'est pas une bibliothèque. Il peut donc se satisfaire de procédures bibliothéconomiques particulières, réduites au strict minimum et ne nécessitant pas de personnel qualifié. La recherche documentaire étant effectuée par les bibliothèques emprunteuses, les procédures portent essentiellement sur le classement des documents. La catalographie passe au second plan.
5. L'investissement de départ est l'inconvénient majeur mais il s'amortit rapidement avec la multiplication des demandes. L'infrastructure s'apparente d'ailleurs plus du hall commercial et du mobilier industriel que de la belle architecture bibliothécaire et cela en terrain hors ville, à bon marché.
6. Les bibliothèques gardent, en tout état de cause, leur liberté d'action, d'acquisition et de prêt.

* * *

Voilà donc brossé assez brièvement un tableau des avantages et inconvénients des différents schémas de réseaux d'accès au document. Le revoici, en manière de synthèse, avec les caractéristiques les plus significatives (Tab 7).

Facteurs d'appréciation / Schéma	Décentralisé	Semi-centralisé	Centralisé
Infrastructure	Réseau de bibliothèques existant	Réseau de bibliothèques existant Structure complexe	Réseau de bibliothèques existant Service central de prêt à distance à créer
Moyens techniques	Indéterminés	Importants et dispersés	Importants et centralisés
Personnel affecté au prêt interbibliothèques	Non prévu	2 personnes spécialisées nécessaires par bibliothèque Fonction en cumul Dispersion de l'effort pour un nombre réduit de transactions	Concentration de l'effort.750 personnes au Service Central de prêt pour plus de 10.000 transcations journalières
Acquisitions	Anarchiques Duplications Lacunes	Semi-dirigées.Rationelles Exhaustives dans certaines spécialités Lacunes Contraintes locales	Exhaustives au service central de prêt pour les documents - les plus demandés - les moins demandés Liberté des bibliothèques Exhaustivité globale
Catalogues collectifs	Non organisés	Organisation régionale et spécialisée	Restreints
Service de prêt	Non structuré Aléatoire Priorité à la clientèle locale	Structures complexes Aléatoire au niveau régional Priorité à la clientèle locale	Régulier et sûr Liberté des bibliothèques
Satisfaction de la demande	Moins de 50 %	65 %	95 %
Temps moyen de réponse	23 jours à plusieurs mois	23 jours	6 jours
Coût moyen de la transaction	15 à 20 $	10 à 15 $	3 à 6 $

Par l'étude de quelques fonctions élémentaires obligatoires dans toute bibliothèque digne de ce nom, j'ai tenté de convaincre, s'il le fallait encore, non seulement de l'impérieuse nécessité d'automatiser ces bibliothèques mais surtout de l'opportunité de passer résolument à un système de liaison interbibliothèques. Il faut, par la force des choses, rationaliser la constitution des fonds de bibliothèques tout en offrant au lecteur la quasi certitude d'accéder, en temps voulu, au document recherché.

"Carences et retards ont acquis le poids d'une tradition", peut-on lire dans le Rapport au Premier Ministre français, établi en 1981 par un groupe interministériel. Il ajoute : "C'est parce qu'ils sont résignés, à la longue, aux défauts des bibliothèques universitaires, que les professeurs et étudiants n'en font jamais un problème important de l'enseignement supérieur. Ainsi, de retards historiques en relances trop vite retombées, en est-on arrivé à une conjoncture de la dernière chance : c'est maintenant ou jamais, à deux décennies de la fin du siècle, qu'une politique soutenue des bibliothèques doit être lancée à tous les niveaux de responsabilité".

J'ajouterai que, sous peine de ne pouvoir maîtriser la conjoncture, cette politique, à tous les niveaux de responsabilité, doit convaincre des bienfaits de solutions pragmatiques déjà éprouvées, qui tournent le dos à la routine ancestrale et répondent mieux aux besoins actuels et des prochaines décennies.

Ma conclusion sera cette phrase de Marc Chauveinc : "Il fut un temps, où il fallait des bibliothèques, et elles furent construites. Il est temps, de nos jours, d'organiser leurs relations, de les mettre en réseau afin que le filet documentaire dont elle constituent les mailles soit aussi serré que possible et puisse collecter une documentation trop nombreuse, trop chère, trop éparpillée, trop difficile d'accès pour chaque établissement pris isolément."

BIBLIOGRAPHIE

1. CHAUVEINC (Marc), "Le réseau bibliographique informatisé et l'accès au document", Paris : Les Editions d'organisation, 1982, 283 p.

2. REPUBLIQUE FEDERALE D'ALLEMAGNE, Zeitschrift für Bibliothekwesen und Bibliographie/Sonderheft 24, "Uberregionale Literaturversorgung und Kostenberechnung in Bibliotheken". Vorträge, gehalten auf dem Bibliothekartag 1976 in Münster, FRANKFURT am Main, 1977, 295 p.

3. HU, BOOMS, and KALTREIDER, "A benefit-cost analysis of alternative library delivery systems" Contributions in librarianship and information science ; n° 13, Library of Congress, ISBN : 0-8371-7528-3, USA 1975.

4. VAN BORM (J.) "Omvang, karakteristieken en kosten van het IBL-verkeer aan de UIA ; IN Archives et Bibliothèques de Belgique - Archief- en Bibliotheekwezen in België, 1980, T.LI N°1-2 pp 160-202.

5. USA, "Academic Libraries by the Year 2000", Essays honoring Jerrold Orne, by Herbert Poole, New York & London, 1977, 205 p.

6. FRANCE, "Données statistiques sur l'édition de livres en France", IN Livres Hebdo Vol III-N° 36 - 8/9/81, pp; 83-108.

7. FRANCE, "Les Bibliothèques en France", rapport au Premier Ministre établi en juillet 1981 par un groupe interministériel présidé par Pierre Vandevoorde, Dalloz, Paris 1982, ISBN 2-247-00336-2, 447 p.

8. BELGIQUE, Autobib, Nieuwsbrief automatie voor openbare bibliotheken, Eindrapport toepasbaarheidsonderzoek, Ministerie van Nationale Opvoeding en Nederlandse Cultuur, Steenokkerzeel, 1 augustus 1980.

9. WILSON (Patrick), "Public Knowledge, private ignorance. Toward a Library and Information Policy" ; Contributions in Librarianship and Information science Nr 10, Greenwood Press, USA, England, 1977, ISBN 0-8371-9485-7, 156 p.

FORUM DISCUSSION – INTRODUCTION

by

Dr M.P.CAROSELLA
Director, Documentation Section, Istituto Di Studi Sulla Ricerca
E Documentazione Scientifica, CNA,
Via Cesare de Louis 12, 00185 Rome, Italy

FORUM DISCUSSION – INTRODUCTION

Dr M.P.CAROSELLA
Director, Documentation Section, Istituto Di Studi Sulla Ricerca E Documentazione Scientifica, CNA,
Via Cesare de Louis 12, 00185 Rome, Italy

1. Le but de cette introduction est de provoquer une discussion sur les problèmes que les besoins actuels d'information posent en Italie; on va donc tracer ici une esquisse synthétique sur la situation de l'information scientifique et technique dans notre Pays la plus objective possible, sans aucune prétention d'originalité ni de couvrir tous les éléments - si différents et dispersés - qui y jouent un rôle. Un cadre plus complet et clair devrait évidemment ressortir de la discussion générale, grâce aux interventions des personnes présentes. Des suggestions et eventuellement des reccomandations seraient aussi trés utiles pour modifier ou élargir le panorama que je vous présenterai.

   Il est utile de rappeler avant tout le "thème" de cette réunion, ainsi qu'il est reporté dans le "meeting announcement". Son objectif essentiel est celui d'offrir "une plus large dissémination des informations sur la demande en matière de services d'information scientifiques et techniques dans les pays de l'OTAN (dans ce Forum on se limitera à un des pays: l'Italie) et sur l'utilisation de ces services...", et plus en particulier d'illustrer "les besoins au plan de l'établissement de réseaux, des services de traduction et de l'accès aux communications"; et ancore de décrire "les possibilités actuelles touchant les services en direct, les bases de données et les systèmes de distribution des documents".

   Il est souhaitable que les interventions des présents touchent ces sujets-ci, ainsi que d'autres traités dans notre introduction, et tous ceux qui pourraient être nécessaires à la compréhension et à la solution des problèmes de notre Pays dans le domaine de l'information scientifique et technique. Il faut aussi ajouter qu'une partie - et la plus actuelle - des sujets mentionnés a été déjà décrite dans la Session II par T.M. Lazzari dans son exposé sur l'"information on-line in Italy", raison pour laquelle cet important thème ne trouvera pas ici la place qui lui est dûe; cependant le sujet devrait être également considéré dans la discussion qui va suivre cet exposé.

2. Pendant le 7 dernières années, à diverses reprises, j'ai été chargée de tracer (avec ou sans collaborateurs) la cadre de l'information scientifique et technique en Italie, soit par écrit dans des périodiques que pendant des congrès. Tout récemment (en juin 1982) avec les autres membres italiens du Comité pour l'information et la documentation scientifiques et techniques de la Commission des Communautés Européennes (CIDST), nous avons présenté une relation à une réunion de l'AFDIT, c'est-à-dire de l'Association italienne fournisseurs et distributeurs d'information télématique. Je me permets d'en reprendre ici quelques passages.

   Nous commencions par rappeler ce que nous avions déjà affirmé en 1980 pendant un séminaire sur Diane/Euronet. "La situation de fond existant dans notre Pays dans le secteur de l'information et de la documentation scientifiques et techniques est caractérisée par quelques initiatives sectorielles, très avancées du point de vue scientifique et technologique, et par des compétences remarquables qui ont été cependant acquises par des milieux plutôt restreints; façe à tout ceci se trouvent une 'non-connaissance' générale du développement des nouvelles technologies de diffusion de l'information et surtout l'absence d'une politique concrète de coordonnement du développement de ce secteur".

   Nous continuions en remarquant qu'en 1982 la situation n'est pas très différente en ce qui concerne ce dernier point. Au contraire, dans la dernière année la situation a subi une nette évolution sous le profil des connaissances et du marché de l'information (ainsi que T.M. Lazzari l'a illustré). Malgré cela, le "gap" qualitatif et quantitatif est ancore sensible par rapport aux autres Pays technologiquement avancés.

   Dans notre Pays il n'existe ni un plan ni une structure gouvernementale de coordonnement des activités d'IDST.

   Au niveau du gouvernment la nomination des délégués nationaux dans les groupes de travail du secteur crées auprès des organisations intergouvernementales comme la CEE, l'OCDE, l'UNESCO, dépend du Ministre pour le coordonnement de la recherche scientifique (qui est un ministre sans portefeuille, c'est-à-dire sans fonds et personnel propres) et du Ministère des Affaires Etrangères. En général, les délégués proviennent de l'administration publique, d'organisations appartenant à l'Etat ou qui sont sous son contrôle.

   Cet ensemble de personnes, toutes compétentes dans le demaine de l'IDST et visiblement animées de bonne volonté, si elles étaient coordonnées d'une manière adéquate, pourraient déjà être considérées un embryon de structure de support pour une politique

du secteur.

3. Le facteur international a toujours joué un grand rôle pour le développement de l'information scientifique et technique en Italie. Puisque notre Pays est membre des organisations intergouvernementales citées plus haut et aussi d'autre organisations internazionales non gouvernementales, telle que la Fédération internationale de documentation (FID), la International Fédération library associations and institutions (IFLA), le Comité technique pour la documentation de l'Organisation internationale pour la standardisation (ISO/TC46), l'Italie participe plus ou moins activement et selon les circonstances à une série très variée d'initiatives, dont nous rappelons les plus importantes.

- Depuis la constitution du CIDST, l'Italie participe avec ses représentants (20 experts environ) aux travaux de ce Comité et à ceux de ses différents Groupes de travail (horizontaux et sectoriels). Un travail qui évidemment ne se limite pas à la présence régulière à des réunions, mais qui concrètement s'est manifesté dans multiples initiatives, aux niveaux international et national, reliées au réseau Euronet/Diane: la participation - par l'entremise du Ministère de l'agricolture - à l'inventaire AGREP (Agricultural Research Project) et à l'AGRIS à travers l'EURAGRIS; la création du CRID (Centre de référence italien pour DIANE); l'action promotionelle pour obtenir une participation italienne au premier "appel aux propositions" communautaire, action renouvellée maintenant pour le deuxième "appel" dont le terme final de présentation est le 31 octobre prochain. Trois action bien différentes, mais qui sont signalées ici à simple titre d'exemple.

  - Depuis sa constitution, l'Italie envoie ses représentants au Groupe de travail pour la politique de l'information, de l'informatique et des télécommunications (ICCP) de l'Organisation de coopération et de développement économiques (OCDE), groupe qui va bientôt se transformer en Comité pour l'informatique, et auquel l'Italie va continuer à participer.

  - Notre Pays collabore aussi à différents niveaux avec l'UNESCO et en particulier avec son Programme général pour l'information (PGI). En outre un représentant de l'Istituto di studi sulla ricerca e documentazione scientifica du Conseil national des recherches (ISRDS-CNR) est le responsable de l'implémentation du RAHNIS (Research and human needs information system) de l'UNESCO; ce même Institut est le siège du Centre national de l'International serials data system (ISDS) qui est de quelque façon relié à l'UNESCO.

  - L'Italie participe aussi à l'INIS (International nuclear information system) qui se relie à l'IAEA (International atomic energy agency), grâce à l'ENEA (Comitato nazionale per lo sviluppo dell'energia nucleare e delle energie alternative) ex CNEN, qui représente l'"INIS liaison officer" national.

  - Quant à la collaboration avec les organisations internationales non gouvernementales plus importantes de notre secteur, l'ISRDS-CNR est le membre national de la FID, l'AIB (Association italienne bibliothèques) est membre de l'IFLA et le Comité UNI/DRM (Comité documentation, reprographie, micrographie de l'Organisation nationale d'unification) ex UNI/DRD se relie à l'ISO/TC46.

  Dans notre Pays se réalisent des collaborations bilatérales, trilatérales etc. dans le domaine de l'IDST, c'est-à-dire la participation à des réseaux, à des systèmes, avec d'autres pays. Ainsi par exemple la Station expérimentale pour le verre de Murano participe au pool du verre, qui réunit des instituts analogues de France, Belgique, Ceoslovaquie, République fédérale d'Allemagne, Italie; l'ISRDS-CNR a participé pendant 7 années au système Pascal pour la Section 101.Science de l'information. Documentation du "Bulletin signalétique" du CNRS français; l'IRSA-CNR (Institut de recherche sur les eaux du CNR) collabore pour l'input italien à l'Aqualine du Water Research Centre anglais.

  La participation de l'Italie aux initiatives internationales citées jusqu'ici, il est bien de le répéter encore une fois, est réalisées de différentes manières. L'outil n'est pas nécessairement le plus moderne: l'ordinateur (pour cet aspect, il faut se référer encore une fois au texte de T.M. Lazzari); parfois la contribution à un réseau automatisé se fait encore au moyen de la fiche traditionnelle. Etant donné le peu de temps à disposition, nous avons préféré ne pas entrer dans le détail, mais plutôt insister sur le fait qu'il existe déjà en Italie multiples activités d'information dans différents domaines de la science et de la technologie.

4. Si nous restons maintenant entre les frontières du Pays, nous remarquons que pour le moment il n'existe pas d'association qui réunisse les services d'information et les documentalistes et experts qui y collaborent; cependant nous avons été informé que plus

d'une initiative est en cours pour constituer une association de ce genre. Jusqu'à ce jour, des associations analogues, telle que l'AIB, l'UNI/DRM ou l'AICA (Association italienne calcul automatique) ont été le siège de discussions et études intéressant l'information scientifique et technique. Nous rappelons en particulier les réunions du Groupe d'étude pour les bibliothèques specialisées de la Section Lazio de l'AIB, où l'on discute d'automatisation des bibliothèques, de bibliothèques médicales, de bibliothèques qui s'intéressent d'aéronautique, etc.

- Cependant, notre Pays ne manque pas de bibliothèques spécialisées dans la science et la technologie qui souvent agissent vers leurs utilisateurs comme des services d'information du secteur (information bibliographique, photocopies, parfois traductions), ni il manque de services de documentation: ce qui malheureusement a manqué et manque, est le coordonnement de leur travail.

- Les bibliothèques du pays étudient depuis longtemps l'organisation à adopter pour le "système" bibliothécaire national. Ce système a été discuté en 1979 dans une conférence organisée par le Ministère des biens culturels. L'idée de la nécessité du coordonnement du "service" bibliothécaire national a été renforcée durant cette conférence et un projet d'automatisation de ce même service en est dérivé. Les différents aspects du service seront discuté en novembre prochain au cours d'un congrès organisé par l'AIB.

  Le secteur scientifique et technique a été déjà étudié précédemment (1977) pendant une journée d'étude sur un "service bibliothécaire pour la science et la technique au niveau national", service pour lequel la bibliothèque centrale du CNR devrait servir de centre de référence: tout ceci sera discuté pendant le congrès de novembre de l'AIB.

  La bibliothèque scientifique et technique la plus importante du pays est justement la bibliothèque centrale du Conseil national des recherches de Rome (500 mille monographies et 10 mille titres de périodiques). Par loi elle reçoit une copie de toutes les publications italiennes de ces domaines; elle fournit un service de photocopie de ses publications.

  Les grandes institutions scientifiques, les instituts universitaires, beaucoup de sociétés industrielles, ont leur bibliothèque spécialisée, qui offre un service plus ou moins ouvert au publique.

- Les services de documentation et d'information dépendent eux aussi des administrations les plus différentes. Certains travaillent seulement pour l'organisation à laquelle ils appartiennent, avec des exceptions plus ou moins étendues; ceci surtout dans les sociétés industrielles, comme le Centre expérimental métallurgique, la Olivetti, la Pirelli, la RAI-TV. D'autres institutions par loi doivent traiter et diffuser les informations concernant leur secteur: ceci est le cas des services d'informations des 8 Stations expérimentales pour l'industrie.

  Nous ne pouvons pas nommer ici tous les Centres d'informations italiens, mais nous voulons souligner l'activité du Centre de documentation technique et scientifique de la défense, dont le Col. Morelli a parlé pendant la I Session de cette Réunion; le Service de documentation de la Fondation "Bordoni" pour le progrès des télécommunications; le Service de documentation de l'ENEA; et dans le secteur économique et juridique, l'Institut de documentation juridique du CNR, le CED (Centre éléctronique) de la Cour suprème de cassation, etc.

  Il faut finalement remarquer la création récente de nouveaux services de documentation; tandisque beaucoup d'autres, déjà existant, s'intéressent aux nouvelles technologies; en premier lieu, au moins en prévoyant l'utilisation de l'ordinateur: ceci est le cas du CONI (Sport), etc...

- Les demandes essentielles auxquelles ces services, qu'ils soient automatisés ou non, doivent répondre, sont toujours les mêmes: a) fournir des informations bibliographiques, b) procurer des documents, sous la forme de prêt de livres, de photocopie d'article, de traduction. Il y a évidemment des services plus sophistiqués qui préparent des produits d'information plus raffinés, comme les synthèses critiques sur un sujet donné; mais en Italie leur nombre est irrilévant.

  a) Pour obtenir des informations bibliographiques, on fait toujours plus recours aux bases de données automatisées à travers Euronet ou les réseaux américains via Italcable (voir texte de T.M. Lazzari); mais naturellement on continue à consulter les index et les revues d'analyses imprimées. Nous rappelons ici que le "Notiziario CRID" publie régulièrement un inventaire des bases de données italiennes, qu'elles soient reliées ou pas à Euronet.

  b) Pour se procurer des documents, le prêt des volumes suit les régles du prêt interbibliothécaire, tandisqu'obtenir la copie des articles représente un problème, parce qu'actuellement il n'exixte pas en Italie un centre ou una agence nationale à

laquelle s'adresser pour avoir - si non la copie - au moins des renseignements sur la localisation des périodiques dans les bibliothèques du pays.

Dans les derniers temps, les catalogues collectifs de périodiques se multiplient et sont une aide pour la recherche du document. Le CNR, et en particulier l'ISRDS, a réalisé une archives collective des pubblications périodiques gerée par une procedure automatisée qui permet aussi l'extraction de catalogues collectifs par secteurs et/ou par lieux; elle contient plus de 44 milles titres de périodiques conservés par plus de 1500 bibliothèques distribuées sur le territoire national.

De toute façon, les chercheurs italiens d'adressent souvent aux services de photocopies étrangers, comme la British Library, le CNRS, surtout s'ils ont précédemment consulté Blaise ou Pascal, via Euronet.

La situation de la fourniture de traduction est probablement encore plus individuelle: chacun cherche la solution préférable pour lui; tout ceci implique évidemment duplication de travail, perte de temps, d'argent, etc.

- Malgré tous ces inconvenients d'ordre pratique, en Italie il y a une certaine activité de recherche, d'étude et de publication des résultats dans le domaine de l'IDST. Ceci se doit surtout à l'action de certain instituts come l'ISRDS-CNR, l'IDG-CNR, l'Institut central pour le catalogue unifié des bibliothèques italiennes et pour les informations bibliographiques (ICCU); le CED de la Cour de Cassation, l'INFORAV- Institut pour le développement et la gestion avancée de l'information., l'AIB, l'UNI/DRM etc.

  Pour nous limiter à l'ISRDS-CNR - dont je fais partie - en plus du catalogue collectif des périodiques et de l'activité promotionnelle du "Notiziario CRID", il publie l'édition complète italienne de la classification décimale universelle (CDU) et d'autres aides bibliographiques, comme le tout récent "Manuel pour les bibliothèques spécialisées et les services d'information", ou de précédentes études concernant par exemple les thesauri. Ce dernier sujet - thesauri - intéresse plus d'une organisation et d'un expert italien, ainsi que les différents aspects de l'automatisation.

- Jusq'ici nous avons tracé un cadre d'actions passées et en cours et nous en avons citées quelques unes qui pourraient se développer dans le futur immédiat. Ce cadre ne veut pas être plus positif que la réalité; nous avons déjà parlé de l'absence d'associations professionnelles, du "volontariat" de plusieurs initiatives, mais si l'on veut signaler l'aspect le plus négatif du secteur de l'IDST en Italie, nous serions obligés d'indiquer l'absence presque totale de possibilités de formation professionnelle régulière, moderne et efficace et l'absence évidente d'un coordonnement à tous les niveaux. Sur ce dernier point, on croit toujours que la solution est proche, mais elle se révèle toujours un mirage. Quant à la formation, les cours se multiplient à tous les niveaux (bibliothèques, services d'information automatisés ou non): ils sont organisés par des institutions scientifiques ou administratives (provinces ou régions), sans toutefois qu'ils soient reliés entr'eux ou cohérents à une ligne commune à tout le pays.

5. A ce point, je crois d'avoir énuméré plus d'un sujet à discuter, à aprofondir, ou sur lequel prendre une position. Je m'arrête, donc, en rappelant que, si je n'ai pas nommé quelques initiatives importantes, cela est dû au fait qu'il est impossible de tout rappeler en si peu de temps et d'espace et surtout que j'ai mentionné les exemples que dans mon activité quotidienne j'ai pu mieux connaître.

MEETING PARTICIPANTS

Mr J C ANDREWS	Chief Librarian, Ministry of Defence, Old War Office Bldg, Room 028, Whitehall, London SW1, England
Cpt G ANGELINI	Stato Maggiore Aeronautica - Ufficio Storico, Capo Sezione "Ricerche Storiche", Palazzo Aeronautica, 00100 Rome, Italy
Mr M ASTUTI	Managing Director, Centro Studi Software SrL, Via Campagnetta 3, 21046 Gurone di Malnate (Varese), Italy
Ing M BALLARIN	ENEA, Direz. Centr. Sistemi Informativi, Via Le Regina Margherita 125, Rome, Italy
Dr M BARBATO	NATO Communications School, CTA-DA, Borgo Piave (Latina), Italy
Lt G BARBAGLIA	Aeronautica Militare, U.S.T. Fiat Aviazione, Via Passo Buole 22, 10100 Torino, Italy
Mr A BARLOW	Manager, Engineering Design Services, Smiths Industries - Aerospace and Defence Systems Co., Bishop's Cleeve, Nr Cheltenham, Glos. England
LR Dir S B BASELT	Der Wehrtechnische Studienbeauftragte, Norbert-Wienerstr 23, 8012 Ottobrun, Fed Rep of Germany
Maj A BEATI	Via Piemonte 64, 04100 Latina, Italy
Mr R BERNHARDT *	Leiter der Hauptabteilung Datenverarbeitung, Gesellschaft für Information und Dokumentation (GID), Herriotstrasse 5, 6000 Frankfurt am Main 71, Fed Rep of Germany
Mr J P BETHELL *	Head, Scientific & Technical Information Dept, SACLANT ASW Research Centre, Viale San Bartolomeo 400, 19026 La Spezia, Italy
Mr W R BLADOS *	Technical Information Specialist, HQ Air Force Systems Command/DLXM, Andrews Air Force Base, MD 20334, USA
Lt Col M BLASI	Comando Generale Delle Scuole - S.M./SMS - Methodologia, 00012 Aeroporto Guidonia, Italy
Lt E BOCCUZZI	Scuola Delle Trasmissioni Cecchignola, Rome, Italy
Ir J B D H BOLT	Manager, Information Centre, Fokker BV, Dept TCINFO, P O Box 7600, 1117 ZJ Schiphol, The Netherlands
Mrs A BONGINI	Biblioteca Centrale, CNR, Piazzale A. Moro 7, Rome, Italy
Dr F BORRINI	Ricercaereo, Aeroporto Pratica di Mare, Rome, Italy
Dr A BOTTINI	ENI, Coordinatore Documentazione dell'ASSORENI, San Donato Milanese, Italy
Dr G BRANCATO	Head of Information Centre, AGIP Nucleare SpA, Viale Brenta 29, 20139 Milano, Italy
Lt Col H BRAUN * +	Dokumentationszentrum Bw, Dezernat A, Friedrich-Ebert Allee 34, 5300 Bonn 1, Fed Rep of Germany
Miss C BRISBOIS	Union Minière SA, Service d'Information, Rue de la Chancellerie 1, 1000 Bruxelles, Belgium
Mr P BRISSET	Aérospatiale, Service Documentation, 12 rue Béranger, 92322 Chatillon Cedex, France
Mr A BRUCE *	Head, Defence Research Information Centre, Station Sq. House, St Mary Cray, Orpington, Kent BR5 3RE, England
Dr G BRUNACCINI	c/o Motordife, Viale Universita 104, Rome, Italy
Miss G CALIGARIS	NATO SACLANT ASW Research Centre, Assistant Librarian/ Documentalist, Scientific & Technical Info. Dept., Viale San Bartolomeo 400, 19026 La Spezia, Italy
Dr P CAMELLINI	ENI - Assistente per l'Informatica Documentale, P. le E. Mattei 1, 00144 Rome, Italy
Dr A CARANDO	ELSAG SpA, Via Hermada 6, 16154 Genova Sestri, Italy
Dr M P CAROSELLA	Director, Documentation Section, Istituto di Studi sulla Ricerca e Documentazione Scientifica, CNR, Via Cesare de Lollis 12, 00185 Rome, Italy

Maj A CECCARELLI	Scuola NBC, Piazzale Villoresi 1, 00100 Rome, Italy
Mr W W CHAN	Asst. General Manager, Kaman Tempo, 816 State Street, P O Drawer QQ, Santa Barbara, California 93102-1469, USA
Mr J P CHILLAG	Head, Special Acquisitions, The British Library, Lending Division, Boston Spa, Wetherby, West Yorkshire LS23, 7BQ, UK
Dr M CICCIA	Comando Del Corpo Tecnico dell'Esercito, Via Antonio Scarpa 18, Roma, Italy
Maj L CIFERRI	Stato Maggiore Esercito, Ispettorato ANBC, Ufficio NBC, Via Della Batteria Nomentana 51, 00100 Rome, Italy
Dr C CIONI	ENI - Responsabile Brevetti e Documentazione dell'ASSORENI, San Donato Milanese, Italy
Capt P COCCOLINI	Centro di Documentazione Tecnico-Scientifica della Difesa, Via Clitunno 33, 00198 Rome, Italy
Dr A COCKX*	Director, Centre National de Documentation Scientifique et Technique, Bibliothèque Royale Albert ler, Bd de l'Empereur 4, 1000 Bruxelles, Belgium
Dr R COLALILLO	Ospedale Principale Militare Marittimo, 19100 La Spezia, Italy
Maj A CORRADINO	Istituto Geografico Militare Italiano, Via C Battisti 10, Firenze, Italy
Mr J G COYNE*	Manager, Technical Information Center, Dept of Energy, P O Box 62, Oak Ridge, Tennessee 37830, USA
Cmdr G COTTINI	Deputy Director, Marimissili Sp, 19100 La Spezia, Italy
Lt Col A CUFFEZ*	Adjoint Informatique Logistique, Etat-Major Force Aeriénne (VSL/I), Quartier Reine Elisabeth, Rue d'Evere, 1140 Bruxelles, Belgium
Mr S DAL VIT	Librarian, Ist. Famacologico Serono, Via Casilina 125, 00176 Rome, Italy
Mr DEL DUCE	RAI - Radiotelevisione Italiana Supporto Tecnico, Progettazione Alta Frequenza, Viale Mazzini 41, 00195 Rome, Italy
Dr O DELMARCO	Researcher, Istituto per la Tecnologia del Legno, 38010 San Michele all'Adige, Italy
Mr G DE MICHELI	ANIE - Associazione Nazionale Industrie Elettrotechniche ed Elettroniche, Via Caccini 1, 00198 Rome, Italy
Cmdr A DE ROSSI	Head, Electronics Section, Ministero Difesa Marina, Mariconavarmi, 00100 Roma, Italy
Cpt G DE STEFANO	Stata Maggiore Esercito, Ufficio Informatica, Via XX Settembre, 00100 Roma, Italy
Lt Col A DIDONATO	Sezione Statistica, Viale Romania 45, 00197 Rome, Italy
Cap Vasc E D DI PRISCO	Marina Militare, Istituto di Guerra Marittima, Coadiutore per l'Organizzazione e l'Economia, 57100 Livorno, Italy
Dr A DRACOS AURELI	Istituto Superiore di Sanita, Servizio Documentazione, Viale Regina Elena 299, 00161 Rome, Italy
Mr A DOMENICALI	Bibliotecario, Facolta di Magistero, Via Savonarola 27, 44100 Ferrara, Italy
Maj N DONATI	Istituto Geographifico Militare, Via C Battisti 10, Firenze, Italy
Gen Isp U FABI	Aeronautica Militare, Ufficio del Delegato Nazionale all'AGARD Piazzale K Adenauer 3, 00144 Rome/EUR, Italy
Cap F FARNETI	Istituto Idrografico Delle Marina, Passo Osservatorio 4, Geneva, Switzerland
Maj M FASSIO	Reparto Sperimentale Volo, Aeroporto Militare, 00040 Pratica di Mare (Rome) Italy
Ing F FERRARI	ENEL, Via G.B. Martini 3, 00198 Rome, Italy
Dr R FIDANZA	Comando Del Corpo Tecnico dell'Esercito, Via Antonio Scarpa 18, Rome, Italy
Dr G FONTANA	Ministero della Difesa, ORMEDIFE - C.El.D, Sez. AM, Viale dell'Universita 4, Rome, Italy
M J J GEORGET	Service Documentation SYG/TD, Aérospatiale, BP 96 78130 Les Mureaux, France
Ing M GERVASI	Ufficio Elettronica e Informatica, c/o Ministro per la ricerca scientifica e tecnologica, Longotevere Thaon de Revel 76, 00196 Rome, Italy

MRS R A GJERSVIK+	Acting Chief Librarian, University Librarian, Div A, University of Trondheim, Norwegian Institute of Technology, Hogskoleringen 1, 7034 Trondheim NTH, Norway
Mr D W GOODE*	Chief Librarian, Royal Aircraft Establishment, Procurement Executive, MOD, Farnborough, Hants GU14 6TD, UK
Prof Ing B GRASSETTI	President, Istituto di Studi per l'Informatica e Sistemi, Via Emilia 47, Rome, Italy
Dr I GROSSI	CINECA - Centro Di Calcolo Interuniversitario, Via Magnanelli 6/3, 40033 Casalecchio di Reno (Bologna) Italy
Ir E GRUTZMACHER*+	Director, Scientific & Technical Documentation Centre for the Armed Forces (TDCK), Nieuwe Frederikkazerne, Van Alkemadelaan 774, 2597 BB The Hague, The Netherlands
Ing Gen J A J GUILLEMINET*	Directeur Adjoint du CEDOCAR, 26 Bld Victor, 75996 Paris Armées, France
Mr J H M HEIJNEN+	Netherlands Bibliographical and Documentary Committee (COBICOC), St Antoniesbreestraat 16, 1011 HB Amsterdam, The Netherlands
Cmdr A IACONESI	Ministero Difesa Marina, Marispelog, 00100 Rome, Italy
Ing G JERVOLINO	Director, Alfa Romeo Avio Spa, Pomigliano D'Arco (Naples), Italy
Mr J JOHNSON	Director, Technical Information Centre, AFWAL/TST, Wright Patterson Air Force Base, Ohio 45433, USA
Maj C M JORGE*	Direcção do Servico de Material da FA, Rua da Escola Politécnica 42, 1200 Lisbon, Portugal
Col D KAYA*	Ministry of National Defence, Dept of Research and Development (ARGE), Ankara, Turkey
Mr G KIROUAC*	Senior Advisor, Science & Technology for Development National Research Council of Canada, Room E-302, M-58, Ottawa, Ontario K1A OR6, Canada
Mr H K KROG*	Managing Director, Norwegian Centre for Informatics, Forskningsveien 1, Oslo 3, Norway
Ing G M LACHEZE*	Aérospatiale, Chef Adjoint du Department Information Documentation, BP No 76, 92152 Suresnes Cedex, France
Ing R LAFERLA	Principal Communications Technician, 5 ATAF HQ, Vicenza, Italy
Mrs F LATTANZIO	I.S.P.T., Viale Europa 160, 00144 Rome, Italy
M O LAVROFF	Chef de Service, Aérospatiale, 12 rue Pasteur, 92152 Suresnes, France
Cap G LAZZARI	Direttore Biblioteca Centrale, Stato Maggiore Aeronautica, Ufficio Storico, Palazzo Aeronautica, 00100 Rome, Italy
Mr T M LAZZARI+	Researcher, Istituto di Studi sulla Ricerca e Doc. Scientifica, Via Cesare De Lollis 12, 00185 Rome, Italy
Prof C LENZI-GRILLINI	Istituto di Botanica Agraria, Universita di Firenze, Piazzale delle Cascine 28, 50144 Firenze, Italy
Mr M J A LETARTE*	Counsellor, R&D for Defence, Canadian Embassy, 35 Ave Montaigne, 75008 Paris, France
Dr G LOCOROTONDO	ENI Biblioteca, Piazzale E. Mattei 1, 00144 Rome-EUR, Italy
Dr F LONETTI	Ospedale Principale Militare Marittimo, 74100 Taranto, Italy
Ing L LUCCHINI	RIV SKF, Via Mazzini 53, Torino, Italy
Mr L N LUSHINA*+	Assistant Associate Administrator for Management (Code N), NASA Headquarters, Washington DC 20546, USA
Mr E J MACADAM	Deputy Librarian, Main Library, Cranfield Institute of Technology, Cranfield, Bedfordshire MK43 0AL, England
Capt MACOR	Stabilimento Militare Collaudi ed Esperienze per l'Armamento, 00048 Nettuno (RH), Italy
Dr M MAGLIOLA	Istituto Superiore di Sanita, Servisio Documentazione, Viale Regina Elena 299, 00161 Roma, Italy
Lt Cdr P MANELLI	CINCNAV/COMEDCENT, Via della Storta 701, 00123 La Storta, Rome, Italy
Dr V MANETTI	Branch Manager, Informatica Distribuita SpA, Via Paolo Mercuri 8, 00193 Rome, Italy
Col M MANGANARO	Stato Maggiore Esercito, Palazzo Esercito, Rome, Italy
Dr G MARACCI	Direzione Generale FS, Servizio Affari Generali, Centro Di Documentazione, Piazza Croce Rossa 1, Rome, Italy

Dr V MARCHIS	Istituto di Macchine et Motori per Aeromobili, Politecnico di Torino, Cso Duca degli Abruzzi 24, Torino, Italy
Col P MARCONI	Costarmaereo 1° Rep. Viale Universita 4, 00100 Rome, Italy
Cmdr R MASTROFILIPPO	Raggruppamento Unita Difesa, Via della Pineta Sacchetti 82 00167 Rome, Italy
Mr M MCLAREN	Management Services, Propellants, Explosives and Rocket Motor Establishment, Waltham Abbey, Essex EN9 1BP, England
Mrs P H MEANS	Director for Technical Information, Technical Information Directorate, Defense Nuclear Agency, Washington DC 20305, USA
Dr M MELLONI	Information Officer, CSELT, Via G Reiss Romoli 274, 10148 Torino, Italy
Cmdr D MERLINO	Capo Reparto, c/o Motordife, Viale Universita 104, Rome, Italy
Mr M MIANI	Tech. Devel. Manager, c/o Datamont SpA, Via Taramelli 28, 20124 Milano, Italy
Mr P MONTIGIANI	Dirigente, c/o MEMOREX SpA Italia, Via B Croce 19, 00142 Rome, Italy
Col G MORELLI*+	Director, Centro di Documentazione Tecnico-Scientifica della Difesa, Via Clitunno 33, 00198 Rome, Italy
Major J F MULLER+	Director, Bibliothèque du Ministère de la Defense Nationale, APDB, Quartier Reine Elisabeth, Rue d'Evere, 1140 Bruxelles, Belgium
Lt Col A A NOGUEIRA-PINTO	O.G.M.A., 2516 Alverca do Ribatejo, Portugal
Mr T C J NORTON+	Chief Librarian, Ministry of Agriculture, Fisheries and Foode, 3 Whitehall Place, London SW1A 2HH, England
Major J T OLIVEIRA	Rua Escola do Exercito 13, 1100 Lisboa, Portugal
Dr G ORIANI	AGIP SpA, Centro Document. e Informazione, 20097 S. Donato Milanese (MI) Italy
Mr C PAOLI+	Adjoint au Chef du Departement 'Organisation Promotion' CEDOCAR, 26 Bld Victor, 75996 Paris Armées, France
Prof R PAOLETTI	Direttore, Istituto di Farmacologia e Farmacognosia, Via A Del Sarto 21, 20129 Milano, Italy
Mrs M PARENTI	Responsabile Servizio Documentazione, CSATA, Via Amendola 173, 70126 Bari, Italy
Mr E PENNISI	Institute Battelle, Geneva Research Centers, 7 route de Drize, 1227 Carouge/Geneva, Switzerland
Ing A PETRUCCI	Istituto di Studi Sulla Ricerca e Documentazione Scientifica, Via Cesare de Lollis 12, 00185 Rome, Italy
Ms A PICOT	Ist. Centrale per Il Catalogo Unico Della Bibl. Italiano, Viale de Castro Pretorio, 00185 Rome, Italy
Capt F PIERUCCI	Maricen Prog., S. Vito, 74100 Taranto, Italy
Mr P PLATEL	Societé Européenne de Propulsion, Tour Roussel-Nobel, Cedex No 3, Paris La Défense, France
Captain V POMPI	Centro Tecnico Militare, Chimico Fisico Biologico Civitavecchia, Italy
Mr R POOL*	Head, Documentation Branch, SHAPE Technical Centre, P O Box 174, 2501 CD The Hague, The Netherlands
Prof F PULIDORI	University of Ferrara, Institute of Chemistry, Via L. Borsari 46, 44100 Ferrara, Italy
Captain R PUNZI	Reparto Sperimentale Volo, Aeroporto Militare, 00040 Pratica di Mare (Rome) Italy
Col R RACCA	Via Arsenale 22, 10124 Torino, Italy
Mr H M RIETVELD	ECN, P O Box 1, 1755 ZG Petten, The Netherlands
Dr A ROSSI	Documentation Officer, Centro Ricerche Fiat, Strada Torino 50, 10043 Orbassano (TU) Italy
Admiral A ROSSI	S.S.P.A.VI°, Lungotevere Tahon de Revel 76, Rome, Italy
Mr L SANI	I.S.P.T., Viale Europa 160, 00144 Rome, Italy

Mr H E SAUTER*+	Administrator, Defense Technical Information Center, Defense Logistics Agency, Cameron Station, Alexandria, VA 22314, USA
Mr E SCAFORA	Istituto Polimeri - CNR, Via Toiano 2, 80072 Arco Felice (NA),Italy
Cap G SCAPPATICOS	Aeronautica Militare, U.S.T. c/o Ditta Aeritalia, C.so Marche 41, 10100 Torino, Italy
Dr H J SCHEPERS	DFVLR e.V, Postfach 90 60 58, 5000 Koln 90, Fed Rep of Germany
Lt Col G SCHILIRO	Stato Maggiore Esercito, Ispettorato ANBC, Ufficio NBC, 00100 Rome, Italy
Dr A SERRAZANETTI	CINECA - Centro di Calcolo Interuniversitario, Via Magnanelli 6/3, 40033 Casalecchio di Reno (Bologna) Italy
Dr F SIMONETTI	Ospedale Principale Militare Marittimo, 19100 La Spezia, Italy
Mrs I SØLVBERG	RUNIT, Strindveien 2, 7034 Trondheim-NTH, Norway
Mr A SONNINO	Universita di Torino, Ist. Medicina del Lavoro, Via Zuretti 29, 10126 Torino, Italy
Prof A SPOSITO	Istituto Universitazio Navale, Via Acton 38, Napoli, Italy
Mr W SONTAG	Technical Information Officer, Bundesamt fuer Wehrtechnik und Beschaffung - AT III 6, Postfach 7360, 5400 Koblenz, Fed Rep of Germany
Sig. C STANCAPIANO	Advertising and Public Relations Manager, c/o MEMOREX SpA Italia, Via Ciro Menotti 14, 20129 Milano, Italy
Ir A S T TAN*	National Aerospace Laboratory (NLR), P O Box 90502 1006 BM Amsterdam, The Netherlands
Major F TERMENTINI	Ispettorato Arma Genio, Via Lepanto 1, 00193 Rome, Italy
Lt Col C TIPALDOS*	Hellenic Air Force General Staff, TEXTED, Holargos-Athens, Greece
Dipl-Ing G TITTLBACH*+	Fachinformationszentrum Energie, Physik, Mathematik, GmbH, Kernforschungszentrum, 7514 Eggenstein-Leopoldshafen 2 Fed Rep of Germany
Cmdr A TODDE	Ministero Difesa Marina, Mariconavarmi, 2°Reparto, Rome, Italy
Col A TORSELLO	Scuola Di Guerra, 00053 Civitavecchia, Rome, Italy
Dr A TUCCI	Stazione Sperimentale del Vetro, Via Briati 10, 30121 Murano (VE), Italy
Mr L TURCONI	Istituto Italo-Latino Americano, P.zza G Marconi 1, 00144 Rome, Italy
Dr E VORWERK	Project Leader, Gesellschaft für Mathematik und Datenverarbeitung mbH, Postfach 1240, 5205 St Augustin 1, Fed Rep of Germany
Miss R G D WADSWORTH	Librarian, Ministry of Defence (PE), National Gas Turbine Establishment, Pyestock, Farnborough, Hants, England
Mrs N C WATKINS-ROBINO	Information Assistant, SACLANT ASW Research Centre (NATO), Scientific & Technical Information Dept., Viale San Bartolomeo 400, 19026 La Spezia, Italy
Miss N M WILDGOOSE*	Director, Defence Scientific Information Service, Dept of National Defence, Ottawa, Ontario K1A 0K2
Mrs E WINKLER	Librarian, NATO, Information Library - Nb 123, 1110 Brussels, Belgium
Mrs J R WOELLER	Information Officer, Plessey Displays, Station Road, Addlestone, Weybridge, Surrey KT15 2PW, England
Dr S A WOODING	Project Manger, Csi Piemonte, Corso Unione Sovietica 216, Torino, Italy
L Cdr L ZAPPATA	Chief of ADP Section, CINCNAV/COMEDCENT, Via della Storta 701, 00123 La Storta, Rome, Italy
Dr G J ZISSIS+	Director, IRIA Center, ERIM/IR&O Division, P O Box 8618, Ann Arbor, Michigan 48107, USA

* Members of the Technical Information Panel

\+ Authors of Papers presented at the Meeting

REPORT DOCUMENTATION PAGE

1. Recipient's Reference	2. Originator's Reference	3. Further Reference	4. Security Classification of Document
	AGARD-CP-337	ISBN 92-835-0325-2	UNCLASSIFIED

5. Originator	Advisory Group for Aerospace Research and Development North Atlantic Treaty Organization 7 rue Ancelle, 92200 Neuilly sur Seine, France
6. Title	USE OF SCIENTIFIC AND TECHNICAL INFORMATION IN THE NATO COUNTRIES
7. Presented at	

8. Author(s)/Editor(s)	9. Date
Various	March 1983
10. Author's/Editor's Address	**11. Pages**
Various	140

12. Distribution Statement	This document is distributed in accordance with AGARD policies and regulations, which are outlined on the Outside Back Covers of all AGARD publications.

13. Keywords/Descriptors

Information centers
Information systems
Military research
Aerospace engineering
NATO logistics
Aerospace industry

14. Abstract

These Proceedings concern an AGARD Technical Information Panel Specialists' Meeting held in Rome, Italy, in September 1982. The Sessions were as follows. Session I – Organisational Structure and Operation of Defence/Aerospace Information Centres (taking, as examples, Centres in the USA, Italy, The Netherlands, and Federal Republic of Germany): Session II – Typical Services Available from Defence/Aerospace and other Technical Information Centres: and Session III – Benefits to Industry, Government, and Universities of a Coordinated Defence/Aerospace Information Structure.

Copies of papers presented at the Technical Information Panel Specialists' Meeting, Rome, Italy, on 29–30 September 1982.

AGARD Conference Proceedings No.337 Advisory Group for Aerospace Research and Development, NATO USE OF SCIENTIFIC AND TECHNICAL INFORMATION IN THE NATO COUNTRIES Published March 1983 140 pages These Proceedings concern an AGARD Technical Information Panel Specialists' Meeting held in Rome, Italy, in September 1982. The Sessions were as follows. Session I – Organisational Structure and Operation of Defence/Aerospace Information Centres (taking, as examples, Centres in the USA, Italy, The Netherlands, and Federal Republic of Germany): Session II – Typical Services Available from Defence/Aerospace and other P.T.O.	AGARD-CP-337 Information centers Information systems Military research Aerospace engineering NATO logistics Aerospace industry	AGARD Conference Proceedings No.337 Advisory Group for Aerospace Research and Development, NATO USE OF SCIENTIFIC AND TECHNICAL INFORMATION IN THE NATO COUNTRIES Published March 1983 140 pages These Proceedings concern an AGARD Technical Information Panel Specialists' Meeting held in Rome, Italy, in September 1982. The Sessions were as follows. Session I – Organisational Structure and Operation of Defence/Aerospace Information Centres (taking, as examples, Centres in the USA, Italy, The Netherlands, and Federal Republic of Germany): Session II – Typical Services Available from Defence/Aerospace and other P.T.O.	AGARD-CP-337 Information centers Information systems Military research Aerospace engineering NATO logistics Aerospace industry
AGARD Conference Proceedings No.337 Advisory Group for Aerospace Research and Development, NATO USE OF SCIENTIFIC AND TECHNICAL INFORMATION IN THE NATO COUNTRIES Published March 1983 140 pages These Proceedings concern an AGARD Technical Information Panel Specialists' Meeting held in Rome, Italy, in September 1982. The Sessions were as follows. Session I – Organisational Structure and Operation of Defence/Aerospace Information Centres (taking, as examples, Centres in the USA, Italy, The Netherlands, and Federal Republic of Germany): Session II – Typical Services Available from Defence/Aerospace and other P.T.O.	AGARD-CP-337 Information centers Information systems Military research Aerospace engineering NATO logistics Aerospace industry	AGARD Conference Proceedings No.337 Advisory Group for Aerospace Research and Development, NATO USE OF SCIENTIFIC AND TECHNICAL INFORMATION IN THE NATO COUNTRIES Published March 1983 140 pages These Proceedings concern an AGARD Technical Information Panel Specialists' Meeting held in Rome, Italy, in September 1982. The Sessions were as follows. Session I – Organisational Structure and Operation of Defence/Aerospace Information Centres (taking, as examples, Centres in the USA, Italy, The Netherlands, and Federal Republic of Germany): Session II – Typical Services Available from Defence/Aerospace and other P.T.O.	AGARD-CP-337 Information centers Information systems Military research Aerospace engineering NATO logistics Aerospace industry

Technical Information Centres: and Session III – Benefits to Industry, Government, and Universities of a Coordinated Defence/Aerospace Information Structure.

Copies of papers presented at the Technical Information Panel Specialists' Meeting, Rome, Italy, on 29–30 September 1982.

ISBN 92-835-0325-2

Technical Information Centres: and Session III – Benefits to Industry, Government, and Universities of a Coordinated Defence/Aerospace Information Structure.

Copies of papers presented at the Technical Information Panel Specialists' Meeting, Rome, Italy, on 29–30 September 1982.

ISBN 92-835-0325-2

Technical Information Centres: and Session III – Benefits to Industry, Government, and Universities of a Coordinated Defence/Aerospace Information Structure.

Copies of papers presented at the Technical Information Panel Specialists' Meeting, Rome, Italy, on 29–30 September 1982.

ISBN 92-835-0325-2

Technical Information Centres: and Session III – Benefits to Industry, Government, and Universities of a Coordinated Defence/Aerospace Information Structure.

Copies of papers presented at the Technical Information Panel Specialists' Meeting, Rome, Italy, on 29–30 September 1982.

ISBN 92-835-0325-2